# VICTIMS WITHOUT VOICE

## A Study of Women Pesticide Workers in Malaysia

Vasanthi Arumugam

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AND
PESTICIDE ACTION NETWORK ASIA AND THE PACIFIC

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# About the Author

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# Foreword

*"For the first time in the history of the world, every human being is now subjected to contact with dangerous chemicals, from the moment of conception until death. The public must decide whether it wishes to continue on the present road, and it can do so only when in full possession of the facts."*

– **Rachel Carson, Silent Spring, 1982.**

After 30 years of Silent Spring being published, the world over especially in the Third World, there has been a tremendous increase in pesticides use. As far back as 1983, a United Nations report estimated that there were over two million pesticide poisoning annually, four per minute worldwide. Half of these took place in the Third World. Today, there are more than 25 million people being poisoned annually.

Here in Malaysia, there are more than 30,000 women pesticide sprayers employed throughout the country by the plantation sector. The large majority of them work on a contractual basis where their jobs remain temporary, poorly paid and unprotected. The work of these women sprayers is very task centred. Each day they face great hazards at work from the use of highly toxic pesticides like paraquat. They suffer from dermatitis to effects on their reproductive health.

Although these women have suffered for over 50 years, very little has been done to bring change to their lives. We are aware that pesticides don't know when to stop killing. And the plantation industry has become addicted to pesticides that they do not see the need for alternatives but more concentrated and more toxic pesticides.

Tenaganita in its small way has been working with women in the plantations. This book which reveals the findings of our study with these women sprayers voice out the issues related to workers. We hope that this book will bring about an awakening to what pesticides do to women workers and to all of us who are consumers of palm oil, cocoa, tea, rubber and their products in one way or another.

The voice we raise can also help in our search for alternatives to pesticides and to the development of a sustainable agriculture that will be people-centred and environmentally friendly.

Action in support of these women is something where everyone can play their part, however small. When you have read this book, perhaps you will be ready to add your voice together with us, in Tenaganita and in Pesticide Action Network (PAN) Asia Pacific, to give voice to the often unspoken, unheeded victims of pesticide poisoning.

**Irene Fernandez,**
**Director, Tenaganita**

**May 1992**

# Preface

*"No one who is not female can be in a position to make accurate statements about women"*

**– Otto Weiniger (1800 - 1903), Sex and Character**

**Victims Without Voice** portrays women pesticide sprayers in the Malaysian plantations. They are the victims without a voice - victims of the society's indifference, and focus of this book, pesticide poisonings.

This book attempts to document the hazards of pesticide use in Malaysian plantation. The book examines briefly why women are particularly vulnerable to pesticide poisonings in Malaysia. It attempts to link the status of women, poverty and why women are exploited as pesticide sprayers without any due concerns for their health.

The book also aims at providing the documentation and a strong case for strengthening existing legislations on pesticides and creating public awareness on the issue.

I am very grateful to Sarojeni V. Rengam, Executive Director of PAN Asia and the Pacific and Irene Fernandez, Director of Tenaganita who jointly initiated this book and were very supportive at every stage of its development. I would also like to thank them for contributing a chapter to the book. I am also grateful to the programme officers of Tenaganita who dilligently carried out the field survey. A special thanks is due to R. Shanthini who took the impossible task of deciphering heaps of indigestible drafts and transforming them into a legible piece. I deeply appreciate Pang Hai Long's commitment to help me with the book and to him, Beth Wood and Jerry Jambu for helping to edit the book. Others who helped us include Anwar Fazal (former Director of IOCU Regional Office for Asia and the Pacific), Rash Behari (Malay Mail) for his comments, ideas and help with the title, Ting Mee Lan for her cover design, K. Baradan (The Star) for information and suggestions, Rob McConnel and Sahabat Alam Malaysia (Friends of the Earth Malaysia) for their materials.

I would also like to thank the many agencies whose financial support have made this effort possible. They include: Evangelische Zentralstelle fur Entwicklungshilfe E.V. (EZE) Germany; CUSO, Canada; Interchurch Fund for International Development (ICFID) Canada; Netherlands Organization for International Development and Cooperation (NOVIB), Netherlands and United Nations Development Fund for Women (UNIFEM).

Finally, to all the Victims Without Voice, who were interviewed, whose identities must remain confidential, THANK YOU.

**Vasanthi Arumugam**

**May, 1992.**

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# List of Abbreviation

| | |
|---|---|
| BHC | Benzene hexachloride |
| BPMC | Butylphenyl-n-methyl carbamate |
| CAS NO | Chemical Abstracts Register Number |
| 2,4-D | Dichlorophenoxyacetic acid |
| DDT | Dichloro Diphenyl Trichlorethane |
| DNA | Designated National Authority |
| EBDC | Ethylene bisdithiocarbamates |
| EDB | Ethylene dibromide |
| EEC | European Economic Community |
| e.g | For example |
| EPA | United States Environmental Protection Agency |
| EPN | Ethyl-nitrophenyl phenylphosponothioate |
| etc. | and so on |
| FAO | Food and Agriculture Organization of the United Nations |
| FELCRA | Federal Land Consolidation and Rehabilitation Authority |
| FELDA | Federal Land Development Authority |
| GIFAP | International Group of National Association of Manufacturers of Agrochemical Products |
| HCH | hexachlorocychlorhexane |
| ICPS | International Programme on Chemical Safety |
| i.e | that is |
| ILO | International Labour Organization |
| IOCU | International Organization of Consumers Unions |

| | |
|---|---|
| IPM | Integrated Pest Management |
| IRPTC | International Register of Potentially Toxic Chemicals |
| ISO-TC | International Organization for Standardization - Technical Committee for Common Names |
| LD 50 | Median Lethal Dose 50 ( to kill 50 percent of test organisms) |
| M$ | Malaysian Ringgit |
| MACA | Malaysian Agricultural Chemicals Association |
| MAPA | Malayan Agricultural Producers Association |
| mg | milligramme |
| ml | millilitre |
| MSMA | Methylarsonic acid |
| n.a | not available |
| NGO | Non Governmental Organization |
| No. | number |
| PAN | Pesticide Action Network |
| PIC | Prior Informed Consent |
| ppm | parts per million |
| 2,4,5-T | 2,4,5-Trichloro phenoxyacetic acid |
| UK | United Kingdom |
| UNEP | United Nations Environment Programme |
| U.S. | United States |
| vol. | volume |
| WHO | World Health Organization |
| wt | weight |

# Introduction

## WOMEN : THE INVISIBLE FARMERS

In the past, women's role in agriculture has been grossly underestimated. Today it is estimated that women produce almost half of the world's food. In Africa, for example, three-quarters of agricultural work is done by women. They are half of the agricultural labour force in Asia. Even in Latin America and the Middle East (where men would deny that their mothers, wives and daughters do any work outside the home) detailed questioning reveals that women are doing a substantial amount of the farming there too.

In Asia, with the exception of China and Vietnam, a general pattern of 'development packages' (including high-yielding varieties of rice and wheat, fertilisers, pesticides, irrigation and tractors) has been superimposed on an existing picture of land scarcity and increasing landlessness. The high-yielding seed requires more work in weeding, spraying, planting and transplanting. It is women who tend to be employed on the big farms to do these jobs. However, their average earnings are less than men's. If the seeds are grown on a woman's own family land, the chances are that the woman will have to do all that extra work without any pay herself.

In Malaysia, about 40 percent of the economically active female population is involved in the agricultural sector.

## The Health Implications to Women Involved in Pesticide Application

Since women's role in agriculture has been very much underestimated, the health problems they face in agriculture have been a neglected area of study and action.

In Malaysia, there are about 30,000 female pesticide sprayers in the plantation sector alone, both permanent and seasonal. On the whole there are about 50,000 field and general workers and about 80 to 90 percent of these are women. The field and general workers who are labelled "unskilled" usually receive the lowest pay and do the fertilising, pruning as well as weeding and pest control including pesticide spraying.

Women enter the agricultural labour force in subordinate roles and are thus exploited more than the male workers. Women are usually the lowest-paid workers and end up with the jobs which no one else will do.

In Malaysia, women working in the plantations face many situation which can endanger their

health. Complaints of sore eyes, skin rashes, burnt fingernails and disruption of menstruation period are common everyday occurences.

The Malaysian Minister of Health in 1988 attributed incidents of pesticide poisoning to unsafe working practices, such as mixing pesticides with bare hands, blowing nozzle of the sprayer with the mouth to remove blockage and carrying out spraying operations without regard to basic safety precautions in handling toxic pesticides. He advised estate managers to pay more attention to worker's health, particularly the preventive health aspects.

Pesticides can be teratogenic to women of reproductive age or embryotoxic for the unborn child, as well as causing harm to the mother. Worse, the damage may be done before the mother realizes she is pregnant.

A 1986 study by the University of Sydney revealed that mothers exposed to pesticides during early pregnancy could have infants with limb deficiency. A greater risk was associated with exposures to which the woman was in close proximity. Another study in the United States found that living in an area high in pesticide use carried 1.9 times, or nearly double, the normal risk for giving birth to a child with a limb reduction defect. There have also been reports of increased occurence of cancer in children in agricultural communities in the United States.

Of all the possible toxic effects such as death, cancer, chronic and acute dysfunction, the deformation or death of the unborn is perhaps the most serious.

Plantation products of palm oil, rubber and cocoa are a major source of foreign exchange for Malaysia and have made a vital contribution to the fortune of the owners. Yet, the estate labour force lives in poverty, exposed to toxic chemicals.

## THE STUDY

The study has been undertaken to document the extent of the problem in the plantations. It is an attempt to give a voice to the women workers, to record and publicise their plight.

In early 1991, Tenaganita and PAN Asia and the Pacific collaborated on a study on the impact of pesticides on women workers in the plantations in Malaysia.

The study included :-

1. In-depth interviews with 50 women pesticide sprayers.

2. Research into the role and status of women in agriculture and particularly the status of Indian women in the plantation sector.

3. Research into the effects of pesticides used by women workers in the plantations.

4. Research into the pesticide laws in the country and other legal instruments related to the use of pesticides.

For the interviews, the 50 women were chosen at random from six estates from the State of Selangor, Malaysia.

The survey, undertaken by Tenaganita, was done throughout the months of January 1991 to March 1991. Tenaganita's programme officers lived in the community under study and participated fully in the community life, keeping detailed notes on what they heard, saw or felt about women working with pesticides. In addition, a detailed look at the women's socio-economic problems provided a clear understanding of the issues involved.

PAN Asia and the Pacific analysed the findings and did the research into the health effects and available legislation on pesticides.

This report is part of a 7-country study undertaken by PAN Asia and the Pacific on the impact of pesticides on women. The other countries are Indonesia, Thailand, India, Korea, Sri Lanka and the Philippines.

## THE WORKSHOPS ON WOMEN AND PESTICIDES

As part of its Women and Pesticides programme, PAN Asia and the Pacific is organizing a series of small training workshops with a special focus on women groups. Workshops will be held between 1991 and 1992 in Malaysia, Indonesia, Thailand and the Philippines and 1992-1993 in India, Pakistan and Sri Lanka.

Objectives of these workshops are as follows:

- to offer training, information and education activities to build leadership among consumer and other public interest groups working on women's issue and to increase citizens involvement in pesticide issues.
- to find out the real conditions of women's exposure to pesticides in a number of Asian countries and to use the information to strengthen legislation and to build public awareness of the issues.
- to link up with public interest groups in other areas especially women's groups working with agricultural workers.
- to actively support women's involvement in leadership roles.
- to build a more cohesive network of local pesticide monitors and advocates for sustainable pest control.
- to improve and expand the use of existing training and information and education resources.

The first workshop was held in Malaysia. PAN worked closely with Tenaganita in organising the workshop which was held from 3- 8 June 1991 in Serdang, Malaysia.

A total of 20 participants from 10 different local organizations attended the 5-day workshop. There were two resource persons from Indonesia and a participant from Thailand at the workshop to share their experiences and campaign successes in their own countries.

The participants worked together and brainstormed on strategies for action. As a result, their recommendations were put together in the Serdang Declaration (see Appendix 1).

# CHAPTER 1

# The Victims

**"I have irregular menstrual cycle... and tears flow uncontrolably from my eyes for the past two years ..."**

**Voice of the Victim**
**March 1991**

# The Victims

Fifty-three year old Veena suffers from various kinds of medical problems.

*"I have been spraying pesticides for the past 20 years. I spray Gramaxone (paraquat) all the time. It is so strong that the odour makes me sick most of the time. In the beginning, I used to cry (tearing in my eyes from the strong fumes). Now my only main problem is nose bleed and chest pain. I also have bad stomach pain."*

Veena has not consulted a doctor about her existing health problems. Seeing a doctor means spending money and taking leave from her work. She would have to take leave without pay and that would be an additional strain on her finances. She said bearing with the pain and going on with life as usual is easier than seeing a doctor and spending money on transport.

*"I carry a four-gallon pesticide tank and spray. It's refilled 25 times which means I carry 100 gallons per day. While carrying the tank, I climb a slope of 200 feet ."*

Veena does not wear the protective clothings provided by the plantation management. She feels hot and uncomfortable when using the protective clothings in this climate. No one in Veena's circle of co-workers use protective clothings. They all have the same complaint. In any case, Veena and her friends have accepted pesticides-soaked clothes as normal and no cause for alarm.

*"Most days, when we come back from work, we are soaked with the chemical, top to bottom and we are so used to it as we have been working with it for years. Of course the chemical burns our skin but we don't really bother as we have to work. If our skin gets really bad, then we will go to the hospital."*

Veena is the sole breadwinner of the family. Her husband, an alcoholic, has been unable to work for the past few years. He spends his time lounging around the house. He consumes a packet of cigarettes and a bottle of alcohol daily.

Veena has two grown up sons. They too are unemployed and rely on their mother for their living. Veena confides that her only hope is for her sons to find good jobs and contribute money to the family. Her six children are in school but she might have to stop them from schooling as she has no money for their transport and other incidental expenses.

As she gave this testimony, Veena sighed with weariness and frustration. She hopes for something better so that she does not need to stop her children's schooling.

In spite of her poverty, she insisted on serving drinks for us, a reflection of her hospitality. Her living quarters were miserable. She and her family of nine live in a house with one room, it has a small charcoal stove, a small bed, no chairs, no tables, no electricity, no bedrooms - a mere roof over their heads.

Although Veena's life is a terrible struggle in many different ways, she somehow retains her sense of humour.

After the interview, we said good-bye to Veena and left with one question uppermost in our minds:

**After 20 years of exposure to paraquat, is Veena's stomach pain, blurred vision and skin rash a common health problem faced by women everywhere, or is it a symptom of chronic pesticide poisoning?**

Mixing pesticides at the plantation

Meena, 48, lives in a housing quarters on an oil-palm plantation. Since starting work at the plantation 25 years ago, she is still spraying pesticides.

Meena sprays paraquat everyday. In the beginning she used to feel tightness in her chest each time she mixed the paraquat. Now paraquat does not have the same effect on her.

*"I sort of lost touch with that feeling especially after inhaling it for five years. Like many other women sprayers, I grew to fight the uneasiness of working with pesticides. Well, what can I do if it is painful - I have nine mouths to feed (eight children and a husband). My husband is an asthmatic patient, so he is not working. If I decide to take my health problems seriously, my family will go hungry. Pesticides or no pesticides, I have to spray in order to support my family.*

Meena feels run-down and has never had a regular menstrual cycle. She finds working during rainy days extremely painful.

*"You spray pesticides everywhere, and when it starts to rain you can smell the chemicals steaming up in the rain. The pungent acid smell is so overpowering that I immediately feel a pounding in my head and dizzy and on such days, I just sit down, rest and slowly find my way home."*

As she talked to us, she stretched her legs and we saw enormous varicose veins around her right ankle. Taken aback by our surprised look, she glanced down at her foot and smiled.

*"Ah! that is what I have inherited from working all day long, these varicose veins! I have to go out very early in the morning while it is still dark to spray pesticides. I came back in the afternoon to cook for my children and then go out again to spray more pesticides. I come home late in the evening, just before dark and start cooking and washing. I go to sleep at eleven or twelve at night. But if my husband drinks he beats me and I usually sleep very very late. But I am used to this life."*

This is a reflection of the hardship experienced by women with a similar background in the plantation.

She also shared with us her experience in consulting the medical officer in the estate hospital about her illness.

*"Sometime back, I developed a rash on my legs. I went to the hospital and the Hospital Assistant told me it was a heat rash. He gave me some cream and assured me that it would go away in a few days. The rash persisted and I went back. This time, he shouted at me, gave me more cream and that was the end. The rash did not go away. I still have the rash. But now I have learned to live with* it."

Meena's life is hard. In the morning and evening she sprays pesticides and at night she does housework. Although she works 10 hours a day, six days a week spraying pesticides, she would still work overtime on Sundays if asked to. She says the extra income is helpful.

She puts in a lot of effort to ensure her family's well being. However, her three sons just sit around the house, neither studying nor working. They don't help her with anything, not even with washing their own plates after eating.

She hopes that her sons will go to work and she can get her daughters married. But the thought of her daughters' marriage worries her.

*"I have six girls. I have to save enough gold to give their husbands on their wedding day. That is my main worry. Where am I going to find these money to buy the gold. Nowadays no man will marry a girl in the estate unless she brings enough gold in marriage. I hope everything will go well."*

A sprayer using the protective clothings provided by the management

Deena was 17 years old when she first started working as a sprayer on a large oil palm plantation. On 4th July 1986, whilst she was pouring paraquat from one container to another, the deadly pesticide splashed into her left eye.

The management had not provided her with any safety equipment. She searched for clean water to wash her eye. However, the only water available was found in a drum that had contained paraquat. She waited for 15 minutes before her co-workers collected enough drinking water to wash her eye.

Subsequently, she was taken to the estate hospital where a paramedic examined her. She was given a medicated cream to apply onto her eye. She was also given 8 days leave. Her left eye persisted to be red and watery. After 10 days, she was referred and admitted to the plantation hospital. She remained there for 2 weeks. On 29th July, the doctor diagnosed her as having laceration/photophobia. At this point the redness was gone but the tears still flowed from her eye.

When she returned to work, she was again assigned as a sprayer and the affected eye became red again.

On 23rd December, 1986, she was admitted to a government hospital where she received further treatment. This time she was diagnosed as having "Paraquat Conjunctival Flare" and "Photophobia". The doctor advised her to work in a shady place wearing dark glasses.

However, upon returning to work on 6th January, 1987, she was once again given field work without any protective clothing. She developed severe headaches on the left side. She could not watch television for long or go into the sun for long period. Cutting onions, ginger and certain vegetables would aggravate her left eye.

She finally quit her work on the plantation.

During her ordeal she felt powerless to take compensatory action and was not informed of her rights.

Deena is married and is expecting her second child when giving her testimony. The tears in her left eye still flow uncontrollably.

**She remains a Victim Without a Voice.**

# CHAPTER 2

# The Poisonings

**"An 18 year old male was referred to the hospital with a history of fever and yellowish phelgm. His saliva was blood tinged and he had difficulty swallowing and breathing. Other features include gross abnormal swelling of body tissues caused by the accumulation of air from the neck. There was signs of impaired chest expansion...**

**General examination revealed a boy with difficulty in breathing, jaundice... tongue was swollen and coated... with the throat congested. Despite 3 days of close medical attention, the patient deteriorated and died. An autopsy revealed a deeply jaundiced body with extensive decay of tissue of the throat and tongue... the kidneys had bilateral cortical haemorrhage and the liver was enlarged, yellowish and haemorrhagic. Both the lungs were swollen and showed internal bleeding..."**

**- A Paraquat Poisoning**

# The Poisonings

Pesticides are poisons designed to kill living things. The acute and chronic effects of exposure to them range from obvious poisoning such as skin problems to more serious problems.

Women's reproductive health is often affected. Studies have shown that the effects of pesticides on the reproductive system in humans includes lowered sperm counts, decreased ovulation, inability to conceive and birth defects. The World Health Organization (WHO) has estimated that 37,000 cases of cancer occur annually as a result of pesticide exposure.[1]

Exposures to pesticides may cause illnesses immediately or soon after the exposure, or months and even years later. The damage to human health by pesticides is often irreversible.

The extent of occupational health and safety hazards with pesticide poisonings is poorly documented in Malaysia. Although workers are exposed to many hazards from different pesticides, there are no conclusive records that document their exposure.

This lack of documentation on pesticide problems in Malaysia is not an isolated incident, it is globally evident. As Dr. Marion Moses,[2] US Environmental and Occupational Medical Expert observes,

*"Lack of record keeping and the failure to document exposures and illnesses are reasons for little worker population based scientific data on the extent of chronic health problems among plantation workers from pesticides exposures. In this regard the popular response of the agricultural industry to the concerns of plantation workers' health effects from chronic, low-level of exposure to pesticides is* **if there were a problem, we would know about it**. *The long period of clinical latency for some of the effects, especially cancer is another problem In documenting chronic and delayed health effects from plantation workers' exposure to pesticides.*

*Most pesticide-related skin problems are primary irritant or contact dermatitis. However, pesticides can also cause allergic contact dermatitis, which can become a chronic problem – in some cases the workers can be permanently disabled since they cannot tolerate even minute exposures to the pesticide".*

In 1985, WHO estimated that approximately 3,000,000 cases of pesticide poisoning were occurring annually, with approximately 220,000 deaths.[3] More recent reports published in WHO journals point to as many as 25 million agricultural workers in the developing world suffer an episode of pesticide poisoning each year.[4]

## GENERAL PESTICIDE POISONING

In Malaysia, nearly four out of ten poisoning cases between 1979 and 1988 were due to ingestion of pesticides.[5]

Of this, paraquat accounted for 27.8 percent; other weedicides - 1.7 percent; malathion - 4.7 percent; other organophosphates - 2.1 percent; organochlorine - 2.6 percent and other pesticides - 1.4 percent.[6]

A total of 737 farmers have received medical treatments for poisoning from pesticides introduced by the Agriculture Ministry over 1989 - 1990.[7]

The following tables 1-8 illustrate the growing problems posed by pesticides. Paraquat is the single pesticide most freely available and attributed to most of the poisonings and deaths.

TABLE 1: Human Poisoning caused by paraquat, 1978 - 1985

| Year | Total pesticide poisoning cases | Number of cases of paraquat | Percentage of total poisonings |
|---|---|---|---|
| 1978 | 99 | 46 | 46 |
| 1979 | 103 | 57 | 55 |
| 1980 | 124 | 70 | 56 |
| 1981 | 158 | 98 | 62 |
| 1982 | 178 | 126 | 71 |
| 1983 | 245 | 173 | 71 |
| 1984 | 259 | 177 | 68 |
| 1985 | 276 | 211 | 76 |
| TOTAL | 1442 | 958 | 66 |

Source: Toxicology Reports by Department of Chemistry, Malaysia, 1978 - 1985.

In 1985, 76 percent of the total pesticide poisoning cases in Malaysia was caused by paraquat. (Table 1)

TABLE 2: Types of pesticides involved in cases of poisoning admitted to the Medical Unit of the General Hospital, Kuala Lumpur in 1987.

| Types of pesticides | Number of cases of pesticide poisoning |
|---|---|
| Insecticides | 44 |
| Herbicides | 35 |
| Rodenticides | 15 |
| Fungicides | 1 |
| Total: | 95 |

Source: "Poison of Toxic Substances: Response to the Problem in Malaysia", paper presented by Dr. Tariq Abdul Razak, National Poison Centre, Malaysia.

Table 2 shows that in 1987, the Medical Unit of the General Hospital, Kuala Lumpur admitted 95 patients suffering from pesticide poisoning. The results were compiled from a survey on the cases of poisoning admitted to the Medical Unit of the General Hospital, Kuala Lumpur in 1987.

TABLE 3: Cases of death attributed to poisoning at the Medical Unit of the General Hospital, Kuala Lumpur in 1987

| Substances | Number of deaths |
|---|---|
| Herbicides | 7 |
| Insecticides | 1 |
| Formic Acid | 1 |
| Phenobarbitone | 1 |
| Narcotic | 1 |
| Chloroquine | 1 |
| Not specified | 1 |
| Total | 13 |

Source: "Poison of Toxic Substances: Response to the Problem in Malaysia", paper presented by Dr. Tariq Abdul Razak, National Poison Centre, Malaysia

Table 3 indicates that there were 13 deaths attributed to poisoning at the Medical Unit of the General Hospital, Kuala Lumpur in the year 1987. Of these, 7 were attributed to herbicides.

TABLE 4: List of pesticides identified in human poisoning cases by the Chemistry Department, Kuala Lumpur

| Pesticide | | 1987 No | 1987 Total | 1988 No | 1988 Total |
|---|---|---|---|---|---|
| Herbicide: | Paraquat | 139 | | 176 | |
| | Glyphosate | 8 | | 5 | |
| | 2,4-D | 6 | | 5 | |
| | 2,4,5-T | 1 | | - | |
| | Diuron | 1 | | 2 | |
| | Garlon - 250 | 1 | | 2 | |
| | Amethrin | - | | 2 | |
| | | | 156 | | 192 |
| Organophosphate: | | | | | |
| | Malathion | 21 | | 24 | |
| | Dimethoate | 8 | | 3 | |
| | Methamidiphos | 5 | | 1 | |
| | Monocrotophos | 2 | | 2 | |
| | Chloropyrifos | 2 | | 5 | |
| | | | 38 | | 35 |
| Organochlorine: | | | | | |
| | Endosulfan | 8 | | 7 | |
| | Gamma-BHC | 4 | | 2 | |
| | DDT | 2 | | - | |
| | Dieldrin | 2 | | 1 | |
| | Aldrin | 1 | | - | |
| | Heptachlor | - | | 1 | |
| | Diazinon | - | | 1 | |
| | Pentachlorophenol | - | | 1 | |
| | | | 17 | | 13 |
| Carbamate: | Propoxur | 7 | | 4 | |
| | Methomyl | 3 | | 1 | |
| | Carbaryl | 2 | | 2 | |
| | BPMC | 2 | | - | |
| | Mercaptodimethur | - | | 1 | |
| | Carbofuran | - | | 1 | |
| | | | 14 | | 9 |
| **TOTAL:** | | | **225** | | **249** |

Of the 249 pesticide poisoning cases in 1988, 192 were caused by herbicides of which 176 involved paraquat. Thirty-five cases were caused by insecticides and the remainder by other poisons (see Table 4)

## PESTICIDE POISONING IN SPECIFIC STATES IN MALAYSIA

### a/ Accidental Poisoning

TABLE 5: Number of poisoning cases in Cameron Highlands

| Year | Number of Cases |
|---|---|
| 1988 | 17 |
| 1989 | 35 |
| 1990 | 36 |

Source: New Straits Times, 21 April 1990.

In 1990, of the 36 cases reported, weedkillers accounted for 16 cases, organophosphates for 10, fungicide and other chemicals accounted for 10 cases in Cameron Highlands, a district that uses pesticides in vegetable farming. (Table 5)

TABLE 6: Number of paraquat poisoning cases in the State of Negeri Sembilan

| Year | Number of deaths | Total number of paraquat poisoning cases |
|---|---|---|
| 1987 | 49 | 102 |
| 1988 | 56 | 154 |
| 1989 (October) | 43 | 132 |

Source: New Straits Times, 14 January 1990

Table 6 shows the substantial number of paraquat poisoning cases in the State of Negeri Sembilan. The State recorded a total of 102 paraquat poisoning cases in 1987, of which 49 were fatal. In 1988, there were 154 cases with 56 fatalities. Twenty nine cases in 1988 involved accidental consumption of the poison, while in 1987 there were 18 accidental cases.[8]

Between 1986 and 1988 paraquat caused 275 deaths and 520 cases of poisoning.[9]

**b/ Suicide**

TABLE 7: Suicide by Pesticide Poisoning

| Year | Number of suicides by pesticide poisoning |
|---|---|
| 1986 | 270 |
| 1987 | 250 |
| 1988 | 297 |
| 1989 | 294 |
| 1990 (January - March) | 45 |

Source: New Straits Times, 26 March 1991

Pesticides in drums are decanted in the plantation into small plastic containers for use by the workers

TABLE 8: Breakdown of suicide by drinking pesticides in the various states in Malaysia from 1986 to March 1990

| States | Number of victims who died | Number of victims who recovered |
|---|---|---|
| Selangor | 323 | 8 |
| Negeri Sembilan | 171 | 84 |
| Pahang | 151 | 107 |
| Johor | 141 | 9 |
| Kedah | 85 | 9 |
| Perak | 75 | 7 |
| Pulau Pinang | 61 | 39 |
| Sabah | 50 | 9 |
| Federal Territory | 35 | 12 |
| Malacca | 26 | 11 |
| Kelantan | 17 | 1 |
| Perlis | 14 | 0 |
| Terengganu | 5 | 1 |
| Sarawak | 4 | 24 |

Source: New Straits Times, Malaysia, 4 June 1990

Table 8 shows that a total of 1158 people committed suicide by drinking pesticides from 1986 to March 1990. The State of Selangor topped the list with 323 deaths and eight survived suicide attempts. Negeri Sembilan was next in the list with 171 deaths and 84 attempted suicide cases. The States with the lowest number of suicides by pesticide poisoning are Sarawak with four deaths and 24 attempted suicides and Terengganu with five deaths and one attempted suicide.

# HEADLINE NEWS

## 93 pc sprayers don't know toxic colours

THE STAR (Malaysia)
April 30 1992

KUALA LUMPUR: Nearly 93 per cent of pesticide sprayers in eight estates could not recognise or differentiate the toxic colour bands on containers.

This is one of the findings of a research by United Planters Agriculture Council of Malaysia member P. Anamalai who presented the paper at a pesticides conference here.

Anamalai also said workers were "apprehensive" that the protective clothing provided by the management was inadequate and complained that they were uncomfortable to wear.

In another paper, Ibrahim Shafii, the environmental control officer in the Department of Environment, said the 28 pesticide formulation plants in the country produced 14.7 million litres of liquid herbicides and 3.3 million litres of non-liquid herbicides a year.

He said of the 400,000 cubic metres of toxic and hazardous waste generated in 1988, 251 cubic metres were from pesticide plants.

He said about 70,000 pesticide contaminated containers were discarded.

He said these wastes were buried at DOE approved dump sites, or temporary on-site storage. The drums were crushed or melted at steel mills.

## Expert: DDT poisoning 25 key rivers

THE STAR (Malaysia)
April 29 1992

KUALA LUMPUR: A survey of 25 major rivers showed significant levels of the banned pesticides DDT and heptachlor among other chemical residues, a Universiti Malaya scientist said.

Dr Tan Guan Huat of the Chemistry Department said in a paper that high levels of DDT and endosulfans in the Bernam and Selangor rivers had exceeded the critical level for aquatic life.

He also said that the residue levels of BHC, dieldrin and heptachlor in Perlis, Kedah, Merbok, Muda, Perai, Bernam and Selangor rivers had exceeded the levels for aquatic life.

"It is apparent that the ability of aquatic life such as fish to propagate in these rivers may be adversely affected by the presence of this organochlorine pesticides," Dr Tan said.

Residues of polychlorinated biphenyls (PCBs), a chemical group, was found in rivers flowing through industrial areas, showing they originated from the discharge of untreated or poorly treated waste into the rivers.

Dr Tan said the PCBs level in the Klang River exceeded 2,000ng/L level as it flows through the most densely populated and industrial area in Peninsular Malaysia.

He said the result of the study showed that while the levels of organo-chlorine pesticides in most rivers were still acceptable for domestic use, some of those rivers flowing through rice-growing areas had exceeded the danger level.

"PCBs levels in rivers flowing through industrial areas are all quite high though a more extensive monitoring programme has to be carried out to confirm the present survey results."

## THE FINDINGS

*"I use my bare hands to mix pesticides. I honestly don't know if doing it is harmful to me in the long run. But I know it burns my skin "*

*– Sita*

Fifty women pesticide sprayers were interviewed in a random sample covering six estates in the State of Selangor, Malaysia recently. The following are some of the findings.

**Awareness of the Workers**

From the survey carried out, 90 percent of the pesticide sprayers interviewed said they are well aware of the hazards posed by pesticides. They acknowledged the fact that pesticides can be dangerous to human beings if exposures are high or for a long period. (see Table 9)

TABLE 9: Awareness that pesticides are hazardous

| Awareness | Number | Percentage (%) |
|---|---|---|
| Aware | 45 | 90 |
| Not aware | 5 | 10 |
| **Total** | **50** | **100** |

Sample number = 50

TABLE 10: Awareness of how pesticides entered the human body among the pesticide sprayers surveyed*

| Ways pesticide enter the body | Number of sprayers who cited the means of entry | Percentage of respondents who cited the means of entry |
|---|---|---|
| • Inhalation | 30 | 66 |
| • Absorption | 20 | 44 |
| • Ingestion | 45 | 100 |

* Based on 45 sprayers who knew how pesticides entered their body.

The interviewers asked the sprayers to specify how they thought pesticides could enter their bodies. The results are provided in Table 10.

The three possible channels through which pesticides can enter the human body are through the mouth (oral), skin (dermal) and lung (inhalation). From Table 10, it is clear that all the workers interviewed were aware pesticides can be ingested into the human body as they have seen fellow workers die after ingesting pesticides. Sixty-six percent of the workers were aware that pesticides can enter their body by inhalation. They have nausea and burning sensations of their respiratory tract when they are exposed to concentrated pesticides.

Even though absorption through the skin is a common cause of poisoning, only forty-four percent were aware of this. Ten percent of the workers interviewed were ignorant and did not associate skin diseases and skin problems with their exposure to pesticides. A number of them claimed that neither the management of the plantation nor the health authorities informed them that pesticides can enter their body through the skin.

*"I always have difficulty breathing especially when I am spraying in the fields. I think it's because I am getting old."*

*– Laxmi, poisoning through inhalation*

*"My nose bleeds every now and then. I never consult a doctor. It's just a nose-bleed. Nothing serious."*

*– Devi, poisoning through inhalation*

TABLE 11: Workers knowledge of early symptoms of pesticide poisoning.

| **Sprayers** | **Number** | **Percentage (%)** |
|---|---|---|
| Knowledgeable | 5 | 10 |
| Not knowledgeable | 45 | 90 |
| **Total** | **50** | **100** |

Sample number = 50

An analysis of Table 11 indicates that most of the sprayers have no knowledge of early symptoms such as headache, tiredness and dizziness that could be caused by pesticide poisoning.

**Health Facilities**

The majority of sprayers seek medical treatment from estate hospitals as they say it is free of charge. Others who go to private clinics report that the doctors in the estate hospitals do not treat them well. (see Table 12)

| TABLE 12: The choice of medical treatment for pesticide poisonings | | |
|---|---|---|
| **Type of medical attention** | **Number** | **Percentage (%)** |
| Hospitals | 37 | 74 |
| Private clinics | 5 | 10 |
| Indigenous practitioner | 1 | 2 |
| Self medication | 5 | 10 |
| No medication | 2 | 4 |
| **Total** | **50** | **100** |

Sample number = 50

*"I have a skin rash. I go to see the doctor in the estate hospital. He gives me some cream. I apply the cream until I run out of it. My skin rash persists. I must save money to go to the private clinic now."*

*– Minah*

## PESTICIDE POISONING AND HEALTH

### Paraquat

**Paraquat** is in the chemical group called dipyridyls. Dipyridyls compounds bind to and injure certain tissues of the nails, eyes, nose, mouth and respiratory and gastrointestinal tracts. Small doses of fresh pesticides (as from spills, drift or being accidentally sprayed) can cause inflammation (soreness, redness), cell death and holes (ulcers) in mucosal (nose, mouth and throat) linings.

The most severe symptoms of **paraquat** poisoning from ingestion don't appear for several days to weeks after exposure. Nose bleeds and cough can be caused by contact with large amounts of fresh **paraquat**. If **paraquat** is swallowed, it may cause stomach pain, vomiting, diarrhoea, generalized muscle ache. It can also cause liver, kidney and lung damage within 48-72 hours after exposure. If **paraquat** gets onto the skin, it can cause skin rash. If it gets into the eyes, sore, red eyes would result.

The chronic effects of **paraquat** poisoning are discoloured and irregular nails. This symptoms are usually found in sprayers with regular exposure to concentrates of **paraquat**.

Table 13 shows the symptoms and complaints of workers interviewed who spray paraquat, a chemical in the Dipyridyl family.

TABLE 13: Incidence of symptoms/complaints of workers spraying paraquat, a Dipyridyl

| **Symptoms of illness/complaints** | **Percentage of respondents out of the total interviewed who suffered symptoms occasionally** | **Percentage of respondents out of the total interviewed who suffered symptoms very often** |
|---|---|---|
| Nose bleeds | 2 | 2 |
| Cough | 8 | 10 |
| Vomiting | 14 | 8 |
| Generalized muscle ache | 8 | 10 |
| Sore, red eyes | 18 | 40 |
| Skin rash | 10 | 90 |
| Discoloured irregular nails | 20 | 40 |

Sample number = 50

One of the symptoms of acute **paraquat** poisoning is skin rash. The survey revealed 100 percent of the workers suffered from skin rash occasionally or very often. The workers reported that they only go to the estate hospital to see the Hospital Assistant when their skin rash becomes serious.

Most of the workers were not aware that skin rash may be an indication of pesticide poisoning. From past experience, a number of workers reported that the skin of their hands became dry and fissured when they used **paraquat** in the concentrated form. Sometimes this resulted in loss of fingernails. In addition, prolonged contact of **paraquat** with the skin often caused blistering and ulceration of the skin.

The survey also revealed that 50 percent of the workers spraying **paraquat** who have skin rash, were asked to continue spraying pesticides although they had informed the management of their skin problem. One of them said,

*"Do you know how many times I have appealed to my employer that I want another kind of job? The more spraying I do, the worse my skin gets and although it has been six months since I got a letter from the doctor recommending me for a different job, my employer has not stopped me from spraying pesticides. I don't know how much longer I have to wait. Sometimes I feel like*

*just quitting my job because spraying pesticide is so painful, but when I think of my financial difficulties, I just go on spraying inspite of the pain."*

The problem of pesticide poisoning in the plantations is further aggravated by the lack of washing facilities. Workers were unable to wash with soap and water when paraquat spills on their skin.

The survey revealed that there are no washing facilities in the field where workers spray pesticides, workers seldom bathed and shampooed with soap and water when paraquat spills onto their skin. A number of the workers said they sometimes got water from the nearby monsoon drains (only during the rainy season, as these drains are mostly dry at other times). They added that the drain water had also been exposed to the pesticides they spray.

Table 14 shows the washing facilities available in the plantations for the sprayers interviewed.

TABLE 14: Availability of field sanitation in the plantations surveyed

| **Field sanitation in the plantation** | **Percentage of respondents out of the total interviewed who cited having access to the facilities** |
|---|---|
| Pipe water | 10 |
| Monsoon drain | 60 |
| Water (in drums) provided by lorries | 4 |
| No water supplied | 26 |
| Toilet facilities | nil |
| Soap and towel provided | nil |

Sample number = 50

From Table 14, it is clear that proper washing facilities are not provided by management and workers have to resort to extreme lengths to wash themselves e.g. washing in the monsoon drains.

## Carbaryl (Trade name: Sevin)

Carbaryl (Sevin) is in the chemical group called N-Methyl Carbamates. They have similar effects on the nerve function as organophosphates and cause similar symptoms of poisoning.

Symptoms of acute poisoning by **carbaryl** resemble the symptoms of a flu and appear immediately or within 12 hours of exposure.

Symptoms of mild poisoning are headache, unusual amount of sweating, tiredness, blurred/darkened vision, vomiting, stomach pain.

Severe poisoning causes dizziness. Very severe poisoning causes generalized seizures, unconsciousness and difficulties with breathing.

Table 15 shows the symptoms and complaints of workers who spray **carbaryl.**

TABLE 15: Incidence of symptoms/complaints of workers spraying carbaryl, a N- Methyl Carbamates

| **Symptoms of illness/complaints** | **Percentage of respondents out of the total interviewed who suffered symptoms occasionally** | **Percentage of respondents out of the total interviewed who suffered symptoms very often** |
|---|---|---|
| Headache | 80 | 80 |
| Tiredness | 60 | 100 |
| Vomiting | 20 | nil |
| Unusual amount of sweating | 60 | 40 |
| Blurred/darkened vision | 40 | nil |
| Stomach pain | 80 | 40 |
| Dizziness | 20 | 100 |
| Difficulties breathing | 20 | 20 |

Sample number = 40

The participants of the survey, who acknowledged that they sprayed **carbaryl** (sevin) reported symptoms of headache, tiredness, stomach pains and dizziness. In addition, they also complained of blurred and darkened vision when using **carbaryl.** The workers said prolonged inhalation of the chemical sometimes causes dizziness. Other workers indicated that when **carbaryl** was first used for spraying, they inhaled its concentrated fumes and had breathing difficulties and an unusual amount of sweating. With a little rest, they felt better and continued working.

*"Everytime I spray* **Sevin,** *my eyes start to tear. After spraying* **Sevin** *for 15 minutes, I find my vision blurred."*

*– Aishah*

## Dimethoate

**Dimethoate** is in the chemical group called Organophosphates. The greatest danger to field workers from organophosphates is acute poisoning. Organophosphates are one of the most widely used group of insecticides. Poisoning from these compounds occur because organophosphates interfere with an enzyme - cholinesterase (the enzyme responsible for nerve transmission). Early symptoms of poisoning include headache, dizziness and flu-like symptoms. Symptoms of poisoning are progressive and appear within 12 hours of exposure. Mild or moderate poisoning shows the following symptoms: dizziness, unusual amount of sweating, headache, tearing, nausea, tiredness, blurred or darkened vision, vomiting and increased salivation.

Symptoms of severe poisoning are difficulties walking, tiny (pinpoint) pupils in eyes, tight feeling chest, uncontrolled urination, twitching muscles, eyelids and diarrhoea.

Very severe poisoning results in generalized seizures, difficulties breathing, unconsciousness, death would occur usually when there is a respiratory system failure.

Table 16 shows the symptoms and complaints of workers interviewed who spray **dimethoate**.

TABLE 16: Incidence of symptoms/complaints of workers spraying dimethoate, an Organophosphate.

| **Symptoms of illness/complaints** | **Percentage of respondents out of the total interviewed who suffered symptoms occasionally** | **Percentage of respondents out of the total interviewed who suffered symptoms very often** |
|---|---|---|
| Dizziness | 60 | 20 |
| Headache | 100 | nil |
| Tiredness | nil | 100 |
| Blurred/darkened vision | 40 | 20 |
| Unusual amount of sweating | 40 | 20 |
| Nausea | nil | 100 |
| Tearing | 100 | nil |
| Tight feeling chest | 20 | 20 |

Sample number = 35

The most commonly reported symptoms of acute organophosphates poisoning are headaches and nausea in all the workers interviewed.

Repeated exposure of organophosphates at a significant dosage, although not sufficient to cause acute poisoning, may be the cause of persistent headaches, tiredness and tearing among workers interviewed.

The workers complained that when they have persistent headaches and tiredness the medical officer in the estate hospital sends them back with medication for flu.

## Lindane

**Lindane** is in the chemical group called Organochlorine. Not much is known about the specific mode of action of organochlorines. These compounds interfere with the nerves' ability to transmit messages to target organisms (pests) and non-target organisms (humans). The greatest dangers from exposures to organochlorines are skin rash and the risk of slow-to-develop liver, kidney, brain and reproductive system damage and cancer.

Poisoning can also occur when field workers are exposed to very large amounts of fresh organochlorines from drift, accidental spraying or from spills.

Mild and moderate poisoning show the symptoms dizziness, weakness, nausea, excitability, stomach pain, unusual amount of fearfulness and irritability and vomiting.

Symptoms of severe poisoning are muscle twitching, skin irritation, generalized seizures, skin rash and difficulties in breathing.

Many organochlorines can cause chronic skin rash from regular exposure. Many have been found to produce nervous system disorders, possibly involving the brain, peripheral nerves, muscles and liver. It can also cause appetite and weight loss.

Many organochlorines have been found to have adverse effect on reproduction in test animals. In addition, many of them have tested positive in animal cancer tests.

Table 17 outlines the symptoms and complaints of workers interviewed who spray **lindane.**

## Captan

**Captan** is in the chemical group called Phthalimide Derivatives. These compounds irritate the skin and respiratory tract. They are chemically similar to the drug, thalidomide, used in the 1950s to counteract nausea in pregnant women. Thalidomide caused widespread birth defects (shortened or missing limbs). The greatest danger to field workers exposed to phthalimide derivative residues is skin rash and sensitivity.

Acute symptoms are due to the irritating properties of these compounds. Breathing large amounts of spray droplets can cause congestion, breathing problems and sensitization in some individuals.

TABLE 17: Incidence of symptoms/complaints of workers spraying lindane, an Organochlorine

| Symptoms of illness/complaints | Percentage of respondents out of the total interviewed who suffered symptoms occasionally | Percentage of respondents out of the total interviewed who suffered symptoms very often |
|---|---|---|
| Dizziness | 50 | 30 |
| Nausea | 60 | 20 |
| Stomach pain | 60 | 20 |
| Vomiting | 20 | 10 |
| Weakness | 80 | 20 |
| Skin irritation/rash | 50 | 50 |
| Difficulties breathing | 30 | 20 |

Sample number = 36

Table 18 outlines the symptoms and complaints of workers interviewed who spray **captan.**

TABLE 18: Incidence of symptoms/complaints of workers spraying captan, a Phthalimide

| Symptoms of illness/complaints | Percentage of respondents out of the total interviewed who suffered symptoms occasionally | Percentage of respondents out of the total interviewed who suffered symptoms very often |
|---|---|---|
| Skin rash | nil | 100 |
| Difficulties breathing | 70 | 20 |

Sample number = 10

## WORKING CONDITIONS

Table 19 shows the response of the sprayers when asked what information is on the pesticide label. They all know the name of the pesticides they spray. However only two percent of the total sprayers are aware that the label carries information on harmful effects of the pesticide and treatment of poisoning.

TABLE 19: Response of sprayers when asked what information is on the pesticide label

| Specific items asked if on pesticide label | Percentage of response | | |
|---|---|---|---|
| | Yes | No | Don't Know |
| Name of the pesticide | 100 | nil | nil |
| Danger signs/symbols | 40 | 32 | 28 |
| What protective clothing to wear | 6 | 30 | 64 |
| Harmful effects of the pesticide | 2 | 18 | 80 |
| Treatment of poisoning | 2 | 14 | 84 |

Sample number = 50

The survey shows many sprayers are illiterate and cannot read the pesticide label. Even if workers can read them, the complexity of the language on the label makes it difficult to understand the information. Only 40 percent of the workers mentioned the skull and crossbones and recognized it as a danger symbol. Some workers did not think that the labels were important and should be read for their own health and safety.

Fifteen percent of the workers stated:

*"We see films on how to use protective clothing when spraying pesticides. The films also show that pesticides are dangerous if they make contact with our skin. But, that is all we see. We are not told about the harmful effects of the pesticide we are handling or the treatment for poisoning."*

Almost 94 percent of the sprayers expressed concern about the risks of their work and the need for more adequate training and protection. The survey findings expose several shortcomings in current training and supervision of workers dealing with pesticides.

TABLE 20: Precaution taken after spraying pesticides

| Types of precaution taken | Percentage of Response | | |
|---|---|---|---|
| | At the field itself | On reaching reaching home | Hours after reaching home |
| Washing hands | nil | 46 | nil |
| Changing clothes | nil | 16 | 10 |
| Showers | nil | 20 | 80 |

Sample number = 50

Table 20 indicates that 90 percent of the respondents bath or cleanse themselves many hours after reaching home.

TABLE 21: Precaution taken when eating or drinking in the field soon after spraying

| Types of precaution taken | Number of respondents out of the total interviewed who cited taking these precautions | Percentage of respondents out of the total interviewed who cited taking these precautions |
|---|---|---|
| Eat with spoons | nil | nil |
| Wash hands with water | 37 | 74 |
| Wash hands with soap and water | 3 | 6 |
| Wash face | 10 | 20 |
| Do not wash hands | 10 | 20 |

Sample number = 50

All the respondents do not eat with spoons. Seventy four percent of them wash their hands with water before eating. It should be noted that 20 percent of the workers eat or drink in the fields without washing their hands.

The survey results on the availability of protective clothing is shown in Table 21.

Table 22: Availability of protective clothing among pesticide sprayers surveyed

| Types of protective clothing | Percentage of respondents out of the total interviewed who cited being provided with these protective clothings | Percentage of respondents out of the total interviewed who cited using the protective clothings provided |
|---|---|---|
| Coveralls | 20 | nil |
| Gloves | 30 | 10 |
| Eye protection goggles | 30 | 2 |
| Face protection | 4 | nil |
| Aprons | 10 | 2 |
| Coats | 4 | nil |
| Protective boots | 50 | 40 |
| Respiratory protective equipment | 4 | nil |

Sample number = 50

All the pesticide sprayers complained that the recommended safety precautions for pesticides take little account of the realities of working conditions. Some said that wearing the protective clothing on a hot sunny day is so ridiculous that they do not bother to put them on. When the weather is too hot, wearing the protective gear causes heat stress. From Table 22 it is clear that 50 percent of the workers interviewed have no access to any of the protective gear. It is also worth noting that except for a few, the rest of the workers interviewed hardly ever wore the stipulated protective clothing even though they were provided by the management.

When the sprayers were asked why they did not wear the protective clothing provided to them, some of them replied;

*"Even when full precautions are taken, this does not mean adequate protection is guaranteed because we have seen many of our friends who had been wearing the recommended protective clothing being hospitalised for pesticide poisoning. Furthermore, we often have skin rashes due to wearing gloves in hot weather. We are human beings, we are not machines that can be wrapped up in uncomfortable clothes."*

Unless the working conditions of plantations are taken into account by those who manufacture pesticides and by those who draft the precautions for their use, precautions for pesticide

handling will not be followed if instructions cannot be understood, or the clothing causes as much or more discomfort than the symptoms of poisoning.

Table 23 shows the response from the workers to training provided for mixing and spraying pesticides.

TABLE 23: Training provided for mixing and spraying pesticides among pesticide sprayers surveyed

| Methods of use | Trained for each method | Not trained |
|---|---|---|
| Mixing | 2 | 48 |
| Spraying | 5 | 45 |

Sample number = 50

From Table 23, 96 percent of workers were not trained to mix pesticides i.e. the right method is not demonstrated. Ninety percent were not trained to spray pesticides. The lack of training and guidance in the plantations contributes to the high rate of pesticide poisoning cases in the plantations.

The survey showed that workers were often ordered to spray pesticides in residential and recreational places i.e. their housing quarters and fields nearby to keep their living quarters neat and clear of weeds. Often, the sprayers carry home leftover Gramaxone (paraquat) in their spray pump and spray around their living quarters and the football field in the estates where their children play to kill *lallang* (weed) and other wild plants.

## CONCLUSION

A major problem with the interpretation of complaints by sprayers is that most of the complaints are subjective and self-diagnosed, vague to some degree and non-specific. However, it is pertinent to reiterate that the pattern of complaints lends itself to a host of interpretations that are suggestive of pesticide exposure.

The high incidence of specific occupational health and safety hazards is consistent with the work conditions in the cases of:

i) dermal exposure to highly toxic pesticides.

ii) prolonged period of exposure to pesticides.

iii) inhalation of pesticides daily.

iv) lack of awareness of skin absorption.

These statistics probably understate the injuries and health problems suffered by pesticide sprayers interviewed because the questionnaire and personal observation could not detect all the existing problems. The sprayers complaints should be investigated by independent medical experts.

It is worth noting that acute health effects of pesticide exposure range from eye and upper respiratory tract irritation and skin rashes. In addition, many affected workers never see a doctor or are not properly diagnosed. From the interviews, it may be reasoned that the most frequently mistaken diagnoses in workers with pesticide poisoning are flu and gastroenteritis.

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4. Ibid.

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# CHAPTER 3

# The Poisons

**"Companies producing agricultural chemicals should voluntarily withdraw problematic pesticides..."**

**Datuk S. Subramaniam**
**Deputy Agriculture Minister**
**NEW STRAITS TIMES (Malaysia)**
**20 May 1991**

# The Poisons

## INTRODUCTION


Agrochemical products

Modern agriculture is highly dependent on the use of agrochemicals.[1] Pesticide use is now estimated to be 5 million tonnes a year.[2]

In Malaysia, 1990's statistics indicate that M$315 million a year was spent on agrochemicals with M$250 million alone being spent on herbicides.[3]

TABLE 24: Total end-users' value of agro-pesticides, 1987 - 1990

| Pesticides | Value (M$ million) 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|
| Herbicides | 210 | 230 | 240 | 250 |
| Insecticides | 42 | 43.5 | 36 | 41 |
| Fungicides | 16 | 16.5 | 12 | 14 |
| Rodenticides | 9 | 9.5 | 9 | 10 |
| Total | 277 | 299.5 | 297 | 315 |

Source: Malaysian Agriculture Chemicals Association, Malaysian Agricultural Directory and Index 91/92, 1990.

The bulk of pesticides used are herbicides (see Table 24). In 1989, 81 percent of the $297 million expenditure on pesticides was for herbicides. Expenditure on insecticides and fungicides was respectively twelve and four percent. Rodenticides had the smallest market share at three percent.

Sales of pesticides in Malaysia are made mainly through the dealer and retailer network throughout the country. As of June 1990, 4,403 retailers were registered with the Pesticides Board. Table 25 gives the distribution of pesticide retailers by state.

In 1989, rubber and oil palm plantations accounted for more than 60 percent of the herbicides used. Cocoa areas took ten percent; rice - nine percent; orchards - seven percent; and vegetables - three percent. The remaining 11 percent was for forestry and non-agricultural use.[4]

TABLE 25: Distribution of pesticide retailers by state

| State | Number of retailers |
|---|---|
| Johore | 526 |
| Kedah | 475 |
| Malacca | 139 |
| Negri Sembilan | 257 |
| Pahang | 343 |
| Penang | 189 |
| Perak | 633 |
| Perlis | 65 |
| Sabah | 368 |
| Sarawak | 371 |
| Selangor | 463 |

Source: Pesticides Board, Malaysian Agricultural Directory and Index 91/92, 1990.

TABLE 26: Market sizes of some major herbicides, Malaysia, 1989

| Herbicide | Estimated volume (million litres) | Estimated retail retail value (M$ million) |
|---|---|---|
| Paraquat | 15.0 | 112.0 |
| Glyphosate | 2.7 | 74.0 |
| Basta | 0.5 | 12.5 |
| 2,4-D | 1.2 | 10.2 |
| Others | n.a. | 31.3 |
| Total | 19.4 | 240.0 |

Source: Malaysian Agricultural Chemicals Association, Malaysian Agricultural Directory and Index 91/92, 1990.

The most widely used herbicide for many years has been paraquat. In 1989, an estimated 15 million litres with a retail value of $12 million were used (see Table 27). In value terms, this was 47 percent of the estimated total herbicide market. Glyphosate, was a distant second in volume, with (2.7 million litres) but, because of its higher unit cost, had a proportionately higher retail value of $74 million. Basta and 2,4-D were two other popular herbicides.

Herbicides used in the local market are both imported and locally produced (see Tables 29 and 30). Both the volume and value of imported herbicides have not increased from 1985 to 1989. Table 30 shows there is increasing local production and the herbicides produced locally are paraquat, glyphosate, diuron, MSMA, and DSMA.[5]

TABLE 27: Imports of herbicides

| Herbicide | Value in (M$'000) | | |
|---|---|---|---|
| | 1985 | 1987 | 1989 |
| Total liquid herbicides | 14,334 | 18,745 | 12,355 |
| Total non-liquid herbicides | 13,474 | 4,145 | 3,903 |
| Total for liquid and non-liquid herbicides | 27,800 | 22,890 | 16,258 |

Source: Department of Statistics, Malaysia, Malaysian Agricultural Directory and Index 91/92.

TABLE 28: Production of herbicides in Peninsular Malaysia

| Herbicide | Value (M$'000) | | |
|---|---|---|---|
| | 1985 | 1987 | 1989 |
| Liquid herbicide | 72,950 | 106,500 | 122,720 |
| Non-liquid herbicide | 19,730 | 26,620 | 17,410 |
| Total | 92,680 | 133,120 | 140,130 |

Source: Department of Statistics, Malaysia, Malaysian Agricultural Directory and Index 91/92, 1990.

Similarly, insecticide use has also increased in recent years. Although imports have decreased, local production has increased substantially (see Table 29 and 30).

TABLE 29: Imports of Insecticides

| Insecticides | Value (M$'000) | | |
|---|---|---|---|
| | 1985 | 1987 | 1989 |
| Liquid Insecticide | 42,130 | 38,299 | 35,692 |
| Non-liquid Insecticide | 8,186 | 9,934 | 10,938 |
| Total | 50,316 | 48,233 | 46,630 |

Source: Department of Statistics, Malaysia, Malaysian Agricultural Directory and Index 91/92, 1990.

TABLE 30: Local production of Insecticide

| Insecticide | Value (M$'000) | | |
|---|---|---|---|
| | 1985 | 1987 | 1989 |
| Liquid Insecticide | 17,552 | 21,764 | 22,757 |
| Non-liquid Insecticide | 18,648 | 24,212 | 27,199 |
| Total | 36,200 | 45,976 | 49,956 |

Source: Department of Statistics, Malaysia, Malaysian Agricultural Directory and Index 91/92, 1990.

The top selling active ingredients for herbicides, insecticides, fungicides and rodenticides are as shown below. (See Table 31).

TABLE 31: 1990: Ranking of Top Selling Active Ingredients in Dollar Value

| Herbicides | Insecticides | Fungicides | Rodenticides |
|---|---|---|---|
| 1. Paraquat | 1. Methamidophos | 1. Mancozeb | 1. Warfarin |
| 2. Glyphosate | 2. Deltamethrin | 2. Propineb | 2. Brodifacoum |
| 3. Glufosinate Ammonium | 3. Cypermethrin | 3. Copper Fungicides | 3. Bromadiolone |
| 4. Dicamba & Glyphosate isopropyalamine salts | 4. Carbofuran | 4. Metalaxyl | 4. Chlorophacinone |
| 5. Metsulfuron Methyl | 5. BHC | 5. Maneb | 5. Coumatetralyl |
| 6. 2,4-D | 6. Bacillus Thuringiensis | 6. Benomyl | |
| 7. Diuron | 7. Chlorpyrifos | 7. Triforine | |
| 8. Triclopyr | 8. Bendiocarb | 8. Fosetyl-Aluminium | |
| 9. DSMA | 9. Profenofos | 9. Thiophanate | |
| | 10. DDT | 10. Thiram | |

Source: Malaysian Agricultural Chemicals Association, Annual Report 1990/91 & Directory

REFERENCES:


1. Malaysian Agricultural Chemicals Association, Malaysian Agricultural Directory and Index 91/92, 1990.
2. Josie and Farah Zaini, Our Common Future, Making it Happen, ERA Consumer, October 1991.
3. Minister of Science, Technology and Environment, New Straits Times, December 5, 1990.
4. Ibid.
5. Malaysian Agricultural Chemicals Association, Malaysian Agricultural Directory and Index 91/92, 1990.

## THE SURVEY RESULTS

The pesticides that are freely available in the plantations surveyed are as follows:

- Ally (metsulfuran methyl)
- Amine (2,4-D)
- Azodrin (monocrotophos)
- Basta (glufosinate - ammonium)
- Counter (glyphosate)
- Dowpon (dalapon)
- Gramaxone (paraquat)
- Mancozeb (EBDC)
- Manegam (lindane)
- Metiram (EBDC)
- Mitac 20 (amitraz)
- Racun Tikus (warfarin)
- Rogor 40 (dimethoate)
- Round-up (glyphosate)
- Sevin (carbaryl)

The survey result revealed that most of the pesticides used freely in the plantations are either in the "Dirty Dozen"* family or one that has been banned in one or more countries or whose use has been severely restricted in some industrialized countries.

The survey also revealed that Gramaxone (paraquat) is the most popular pesticide as 100 percent of the plantations surveyed, used it. Paraquat, which is often called 'kopi-o' in plantations is a highly toxic chemical and has been the cause of accidental and intentional poisoning among workers for many years.

Amine (2,4-D) comprises 90 percent of all pesticides used in the estates surveyed followed by Round-up (Glyphosate), 80 percent. Other pesticides are used in just one or two plantations respectively.

Information on the list of pesticides used in these plantations including their trade names, dangers and ill effects, classifications according to hazards and some of their regulatory status are provided in the fact sheets in pages 52 to 92. A guide on how to use the fact sheets is provided on page 46.

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*The Dirty Dozen pesticides are 12 pesticides identified by PAN International for education and media attention. The Dirty Dozen Campaign was launched in June 5, 1985 to target these 12 pesticides for strict controls, bans and ultimately elimination. These 12 pesticides are: aldicarb, camphechlor, chlordane, dibromochloropropane, DDT, the "drins" (aldrin/dieldrin/endrin), ethylene dibromide (EDB), lindane/hexachlorocychlorhexane (HCH), paraquat and ethyl parathion.

## GUIDE TO INFORMATION PROVIDED IN THE PESTICIDE DATA SHEETS*

**Common Name:**

The systems for naming chemical compounds are quite complex resulting in chemical names difficult to pronounce, let alone remember. So a simpler, and shortened common name is that recommended by the International Organization for Standardization Technical Committee for Common Names of Pesticides (ISO TC 81).

**Chemical Group:**

Pesticides are classified on a chemical basis into various groups. A chemical group is a family of related compounds that tend to react in a similar way in both the environment and living organisms. Thus, the treatment for pesticides poisoning is usually the same for all pesticides of the same chemical group.

**Chemical Name:**

The chemical name is derived from the chemical structure of the pesticide. The preferred chemical name is that approved by the International Union for Pure and Applied Chemistry (IUPAC). These names tend to be long and confusing but are occasionally the only way to compare chemicals when the common or trade names differ.

**Trade Names:**

Trade names are used to identify the saleable product and its manufacturer and are the names promoted by the chemical company.

*Example of the above*

**Common name:** Aldicarb

**Chemical group:** Carbamate

**Chemical name**: 2-methyl-2-(methylthio)-propionaldehyde O-(methylcarbamoyl) oxime

**Some trade names:** Aldicarb 10G, OMS-771, Temik, UC 21149.

**World Health Organization (WHO) Recommended Classification of Pesticides by Hazard:**

Special mention must be made of the WHO classification of pesticides by hazard which divides pesticides into four different categories based on their toxicity to test animals (see Table 32 on next page). The terms "oral" and "dermal" refer to the route of exposure, while the terms "solids" and "liquids" refer to the physical state of the produce or formulation being classified.

*The data sheets, 2,4-D, Monocrotophos, Glyphosate, Paraquat, EBDC's, Lindane and Carbaryl are reproduced from The Pesticide Handbook: Profiles for Action, 3rd. Edition, International Organization of Consumers Unions and Pesticide Action Network, 1991.

TABLE 32: WHO classification of pesticides by hazard

| CLASS | LD50 for the rat (mg/kg body weight) | | | |
|---|---|---|---|---|
| | ORAL | | DERMAL | |
| | Solids | Liquids | Solids | Liquid |
| Ia Extremely hazardous | 5 or less | 20 or less | 10 or less | 40 or less |
| Ib Highly hazardous | 5 - 50 | 20 - 200 | 10 - 100 | 40 - 400 |
| II Moderately hazardous | 50 - 500 | 200 - 2000 | 100 - 1000 | 400 - 4000 |
| III Slightly hazardous | Over 500 | Over 2000 | Over 1000 | Over 4000 |

**Lethal Dose (LD50) Values**

The LD50 (Lethal Dose) is used to denote the acute toxicity of a pesticide. It is defined as the average dose in milligrams of a particular pesticide per kilogram of body weight (mg/kg) that is needed to kill 50 percent of the experimental animals. The type of animal used (usually rats or mice) and the route of exposure (i.e. oral/dermal) are normally indicated.

It is important to remember that the lower the LD50 value, the more toxic is a particular pesticide. For instance, a pesticide with a LD50 value of 5 mg/kg is twice as toxic as another pesticide with a LD50 value of 10 mg/kg.

Although LD50 values derived from experimental animals are useful indices of the predicted toxicity of pesticides to man, direct extrapolations are subject to several variables including the age, sex, health, number of experimental animals used, route of administration and experimental conditions. It should be pointed out that LD50 values do not take into account the synergistic or cumulative toxicity resulting from the simultaneous exposure to more than one pesticide at a time.

Nevertheless, figures presented in Table 33 may be used as general guidelines for LD50 values vis a vis toxicity to humans.

In practice, the toxicity of a pesticide is most often described in terms of the acute oral LD50 value. However, it is also crucial to determine dermal LD50 values, as a high proportion of the total exposure to pesticides, under most conditions of pesticides use and handling, is dermal in nature. Classification of pesticide toxicity based on dermal LD50 values are lower (more toxic than oral LD50 values. For classification purposes, where the LD50 values vary between the sexes, the LD50 value for the more sensitive sex is used.

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The terms "solids" and "liquids" refer to the physical state of the product or formulations being classified.

TABLE 33: Guidelines for LD50 values in relation to toxicity to humans

| Toxicity rating | Oral LD50 (mg/kg) | Amount that will kill an average adult |
|---|---|---|
| Super toxic | Less than 5 | a few drops |
| Extremely toxic | 5 to 50 | up to a teaspoon |
| Highly toxic | 50 to 500 | teaspoon up to 2 tablespoons |
| Moderately toxic | 500 to 5,000 | 1 ounce to 12 ounces |
| Slightly toxic | 5,000 to 15,000 | 12 ounces to 1/2 gallon |

In this book, the oral LD50 values in the data sheets have been obtained from. 1) RTECS produced by the National Institute for Occupational Safety and Health and provided by the Canadian Centre for Occupational Health and Safety, 1990, 2) The Pesticide Manual: A World Compendium published by the British Crop Protection Council, 1983, 3) The Farm Chemicals Handbook, 1989 published by Meister Publishing Company, 1989 and 4) The WHO Recommended Classification of Pesticides by Hazard and Guidelines to Classification, 1990-1991 produced by the International Programme on Chemical Safety. Where the LD50 values vary between the references, the lower value is used.

**Hazards:**

The hazards to humans because of exposure to a pesticide are listed as specific and general. The general hazards are various symptoms. Specific hazards are either acute (short term) or chronic (long term) in nature.

**Environmental Effects:**

This describes the effects on the environment due to pesticide use. The environmental effects include effects on aquatic life, mammals and birds as well as the mobility and degradation of pesticides in the soil and water.

**Main Use:**

Pesticides usually have one main use against one group of organisms. For instance, an insecticide against insects, a herbicide against herbaceous plants (weeds), a fungicide against fungi (moulds), etc.

**Specific/Other Uses:**

This describes any other uses of the pesticide as some pesticides are used against more than one pest, e.g. an insecticide and a rodenticide. The specific use refers to the crop(s) for which the pesticide is intended.

**Regulatory Control in Some Countries:**

Lists the official position/action/regulations of different government authorities with regard to the pesticide in question. This listing is however not comprehensive and should be regularly updated and expanded.

**List of Country Codes:**

This list gives the abbreviations used for the different 'countries' in the pesticide data sheets.

| | |
|---|---|
| ARG | Argentina |
| AUS | Australia |
| AUT | Austria |
| BEL | Belgium |
| BGD | Bangladesh |
| BGR | Bulgaria |
| BLZ | Belize |
| BRA | Brazil |
| BUR | Burma |
| CAN | Canada |
| CHE | Switzerland |
| CHL | Chile |
| CHN | China |
| COE | Council of Europe |
| COG | Congo |
| COL | Colombia |
| CRI | Costa Rica |
| CSK | Czechoslovakia |
| CUB | Cuba |
| CYP | Cyprus |
| DDR | German Democratic Republic |
| DEU | Germany, Fed Rep of |
| DMA | Dominica |
| DNK | Denmark |
| DOM | Dominican Republic |
| ECU | Ecuador |
| EEC | European Economic Community |
| EGY | Egypt |
| FIN | Finland |
| FRA | France |

| | |
|---|---|
| GBR | United Kingdom |
| GHA | Ghana |
| GRC | Greece |
| GTM | Guatemala |
| HKG | Hong Kong |
| HND | Honduras |
| HUN | Hungary |
| IDN | Indonesia |
| IND | India |
| IRL | Ireland |
| IRN | Iran |
| IRQ | Iraq |
| ISL | Iceland |
| ISR | Israel |
| ITA | Italy |
| JOR | Jordan |
| JPN | Japan |
| KEN | Kenya |
| KOR | Korea, Republic of |
| KWT | Kuwait |
| LIE | Liechtenstein |
| LKA | Sri Lanka |
| LUX | Luxembourg |
| MAR | Morocco |
| MEX | Mexico |
| MLT | Malta |
| MUS | Mauritius |
| MYS | Malaysia |
| NIC | Nicaragua |
| NIG | Nigeria |
| NLD | Netherlands |
| NOR | Norway |
| NPL | Nepal |
| NZL | New Zealand |
| OMN | Oman |
| PAK | Pakistan |
| PAN | Panama |

| | |
|---|---|
| PER | Peru |
| PHL | Philippines |
| POL | Poland |
| PNG | Papua New Guinea |
| PRT | Portugal |
| ROM | Romania |
| RWA | Rwanda |
| SAU | Saudi Arabia |
| SDN | Sudan |
| SGP | Singapore |
| SUN | Union of Soviet Socialists Republic |
| SUR | Surinam |
| SWE | Sweden |
| TCD | Chad |
| TGO | Togo |
| THA | Thailand |
| TUN | Tunisia |
| TUR | Turkey |
| USA | United States |
| VEN | Venezuela |
| WSM | Western Samoa |
| YEM | Yemen |
| YUG | Yugoslavia |
| ZAF | South Africa |
| ZMB | Zambia |
| ZWE | Zimbabwe |

*The term "country" also refers, as appropriate, to territories or areas.*

**Remarks:**

This gives some additional information that may be of use, e.g. incidences of known poisonings and problems resulting from the use of the pesticide.

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* Source: Mostly from the UN Consolidated List of Products Whose Consumption and/or Sale have been Banned, Withdrawn, Severely Restricted or Not Approved by Governments, 3rd. issue, United Nations, New York, 1989.

# METSULFURON-METHYL

**Chemical Name:** Methyl 2-[(4-methoxy-6-methyl-1,3,5-triazin 2-yl) - amino/carbonyl/amino/sulfonyl] benzoate

**CAS Number:** 74223-64-6

**Some Trade Names:**

Ally

**Allie**

Brush-Off

Gropper

**WHO Recommended Classification By Hazards:**

Class IV

| | |
|---|---|
| Lethal Dose for Rats by Oral Route: LD50 | > 5000 mg/kg |
| Lethal Dose for Rabbits by Dermal Route: LD50 | > 2000 mg/kg |

**Hazards:**

Specific

- Acute: Irritating to skin and eyes

**Main Use:** Herbicide

**Specific/other Use:** Selective post-emergence control of weeds in cereal, turf, shrubs and woody plant control. Used as dispersible granules.

**Remarks:**

In UK, wear protective gloves and faceshields when handling concentrate, wash concentrate from skin and eyes immediately, avoid breathing spray mist, wash hands and exposed skin before meals and after work.

## Regulatory Control In Some Countries

| Country | Effective Date | Description of Action Taken/Grounds for Decision |
|---|---|---|
| AUS | | Approved for use. (FCH) |
| GBR | 1986 | Approved for use. (PUHSH) |
| USA | | Approved except 28 percent dry flowable. (FCH) |

**References:**


FCH: Farm Chemicals Handbook, Meister, Willoughby, Ohio, 1989.

PUHSH: Watterson, Andrew, Pesticide Users Health and Safety Handbook. An International Guide, Gower Technical, Aldershot, U.K., 1988.

# 2,4-D

**Chemical Group:** Chlorophenoxy compound
**Chemical Name:** 2,4-Dichlorophenoxyacetic acid
**CAS Number:** 94-75-7

**Some Trade Names:**

Acme
Acme Butyl Ester 4
Acme LV 4
Acme LV 6
Agrotec
**Amine 4**
Amozone
Aqua-Kleen
Chloroxone
Crisamina
Croprider
D 50
Decamine
Dicotox
Dinoxol
DM 4
Dormone
Emulsamine E-3
Estone
Ferxone
Hedonal
Herbicide D
Krotiline
Lawn-Keep
Mecondray
Pennamine D
Phenox
Planotox
Plantgard
Salvo
Super D
Tributon
Weedatul
Weed B Gon
Weedone

**WHO Recommended Classification by Hazard:**

**Solid: Class II: Moderately Hazardous**

| | |
|---|---|
| Lethal Dose For Rats by Oral Route: LD50 | 375 mg/kg |
| Lethal Dose For Rats by Dermal Route: LD50 | 1,500 mg/kg |

**Hazards:**

Specific –

- Acute: 2,4-D is irritating to the skin, eyes and mucous membranes, since it is easily absorbed dermally or by inhalation. Acute symptoms of 2,4-D exposure include: chest and abdominal pain, vomiting, dizziness, and muscle twitching, tenderness or stiffness. Seemingly minor dermal exposures have been known to cause peripheral neuropathy (nerve damage). (PAY)
- Chronic: the U.S. EPA is requiring further studies on the carcinogenicity of 2,4-D. At high doses, reproductive toxicity has been observed in animals, consisting of decreased survival and skeletal malformations. (PAY) There is evidence that it is both mutagenic and carcinogenic. (PUHSH) It can cause toxic injury to liver, kidney, muscle and brain tissues. (PAY)

**Environmental Effects:**

It is harmful to fish. (PUHSH)

**Main Use:** Herbicide

**Specific/Other Uses:** Selective weed killer and defoliant,

**Remarks:**

One of the constituents of Agent Orange, the defoliant used in Vietnam. Chlorophenoxy herbicide use has been associated with increased risks of non-Hodgkins lymphoma a rare type of cancer. Epidemiological studies done by the National Cancer Institute showed a link between non-Hodgkins lymphoma and 2,4-D exposure in farmers in Kansas and Nebraska. (O'Brien)

## Regulatory Control In Some Countries

| Country | Effective Date | Description of Action Taken/Grounds for Decision |
|---|---|---|
| BRA | | Use in agriculture: authorized; use in domestic sanitation: not authorized. (IRPTC 3/88) |
| SUN | Jun 1983 | Pesticide prohibited in all food products (applies to 2,4-D and its compounds). (IRPTC 3/88) |
| USA | | EPA requires label modifications to include disposal statements and use directions. (SCRP) |

**References:**


IRPTC 3/88: International Register of Potentially Toxic Chemicals, IRPTC Legal File 1988, March, 1988.

O'Brien: O'Brien, Mary, "Non-Hodgkins Lymphoma and Agricultural Pesticides: Now it's Nebraska's Residents," Journal of Pesticide Reform, Vol. 8 no. 3, 1988.

PAY: Pesticides and You, Vol. 6, no. 4, October, 1986.

PUHSH: Watterson, Andrew, Pesticide Users Health and Safety Handbook: An International Guide, Gower Technical, Aldershot, U.K., 1988.

SCRP: Suspended, Cancelled and Restricted Pesticides U.S. Environmental Protection Agency, Washington, D.C., 1990.

# MONOCROTOPHOS

**Chemical Group:** Organophosphate
**Chemical Name:** Dimethyl(E)-1-methyl-2-(mtethylcarbamoyl)yvinyl phosphate
**CAS Number:** 6923-22-4

**Some Trade Names:**

| | |
|---|---|
| **Azodrin** | Monodrin |
| Apadrin | Nuvacron |
| Crisodrin | Pillardin |
| Glore Phos 36 | Pillardrin |
| Monocil 40 | Plantdrin |
| Monocron | Susvin |

**WHO Recommended Classification By Hazard:**

**Liquid: Class Ib: Highly Hazardous**

| | |
|---|---|
| Lethal Dose For Rats By Oral Route: LD50 | 14 mg/kg |
| Lethal Dose For Rats By Dermal Route: LD50 | 336 mg/kg |

**Hazards:**

Specific –

- Acute: highly toxic, potent cholinesterase inhibitor. Poisonous if swallowed, inhaled or absorbed through the skin. (FCH)
- Chronic: fetotoxic, decreases fertility, weak mutagen. (EPA)

**Environmental Effects:**

May have potential for groundwater contamination. (EPA)

Monocrotophos is one of the most toxic pesticides to birds. Monitoring and incident reports contain numerous observations of avian mortality attributed to monocrotophos; thus it has potential for causing significant impacts on populations of birds in wildlife. (EPA) It is highly toxic to bees and birds and moderately toxic to fish. (FCH)

| | |
|---|---|
| **Main Use:** | Insecticide |
| **Specific/Other Uses:** | Contact and systemic insecticide and acaricide. Used on cotton, peanuts (FCH) as well as potatoes, sugarcane and coffeee. (ADB 87) |

**Remarks:**

Repeated inhalation or skin contact may without symptoms progressively increase susceptibility to Azodrin poisoning. (FCH)

## Regulatory Control In Some Countries

| Country | Effective Date | Description of Action Taken/Ground for Decision |
|---|---|---|
| BRA | | Use in agriculture: authorized; use in domestic sanitation: not authorized. (IRPTC 3/88) |
| CHN | Jun 1982 | The following uses of monocrotophos are prohibited: 1) on vegetables, tea, fruit trees and herbs; 2) against insects harmful to health of humans and animals; 3) for rat control except when formulated as a rodenticide. These measures were taken because monocrotophos is a highly toxic substance and its use is harmful to human health. (IRPTC 3/88) (CLP3) |
| GBR | | Not cleared for use in the UK but manufactured here. (PUHSH) |
| IDN | Nov 1986 | Banned for use on rice due to adverse effects on brown planthopper predators. (Pres 86) |
| LKA | | Its being phased out gradually from agricultural use. (PRO) |
| MYS | | Restricted because of its toxicity. May be banned because authorities suspect it is misused. The only registered use of this pesticide is for injection of tree trunks, but the material has been diverted for applications on rice, vegetables and other crops. (ADB 87) |
| USA | Jun 1988 | Voluntary cancellation; all products. 30 July 1989 was the last date for the use of the product for manufacturing purposes and the last date for sale and distribution by the registrant, Du Pont. (SCRP) |

## References:


ADB 87: Handbook on the Use of Pesticides in the Asia-Pacific Region, Asian Development Bank, Manila, 1987.

CLP3: Consolidated List of Products Whose Consumption and/or Sale have been Banned, Withdrawn, Severely Restricted or Not Approved by Governments, 3rd. issue, United Nations, New York, 1989.

EPA: U.S. Environmental Protection Agency, "Monocrotophos" Fact Sheet, no. 72, 30 September, 1985.

FCH: Farm Chemicals Handbook, Meister, Willoughby, Ohio, 1989.

IRPTC 3/88: International Register of Potentially Toxic Chemicals, IRPTC Legal File 1988, March, 1988.

Pres 86: "Improvement of Control of Brown Planthopper (Wereng Coklat), An Insect Pest of Rice," Presidential Instruction No.3/1986, Jakarta, Indonesia, dated 5 November, 1986.

PRO: Letter from the Pesticide Registration Office, Sri Lanka, dated 23 March, 1989 to Greenpeace, Washington, D.C., USA.

PUHSH: Watterson, Andrew, Pesticide Users Health and Safety Handbook: An International Guide, Gower Technical, Aldershot, U.K., 1988.

SCRP: Suspended, Cancelled and Restricted Pesticides, U.S. Environmental Protection Agency, Washington, D.C., 1990.

# GLUFOSINATE-AMMONIUM (H)

**Chemical Group:** Organophosphorus

**Chemical Name:** Ammonium-Dl-homoalanin-4-yl (methyl) phosphinate

**Some Trade Names:**

| | |
|---|---|
| Basta Finak | **Basta** |
| Basta 200 AS | Hoe 039866 |
| Basta 205L | Finale (RAP) |

**WHO Recommended Classification By Hazard:**

Class III: Moderately Hazardous

| | |
|---|---|
| Lethal Dose For Rats By Oral Route: LD50 | 1625 mg/kg |
| Lethal Dose For Rats By Dermal Route: LD50 | >2000 mg/kg |

**Main Use:** Herbicide

**Specific/Other Uses:** Non-selective contact herbicide with some systemic action. Control of wide range of annul and perennial weeds and grasses in orchards, vineyards and vegetables. (FCH)

**References:**

RAP: Regional Agro-Pesticide Index, Volume 1, Asia, ARSAP/CIRAD, Bangkok, 1989.

FCH: Farm Chemicals Handbook, Meister, Willoughby, Ohio, 1989.

# GLYPHOSATE

**Chemical Name:** N-(phosphonomethyl)glycine
**CAS No:** 1071-83-6

**Some Trade Names:**

| | |
|---|---|
| Brez | MON 39 |
| Combine | MON 139 |
| **Counter** | Pounce |
| Eagle | Raider |
| Express | Red Star Glycel |
| Fire | **Roundup** |
| Glycin | Spark |
| Harcros Counter | Surpass |
| Keunsami | Touchdown |
| Kleenup | Tumbleweed |
| Methomne | |

**WHO Recommended Classification By Hazard:**

**Solid: Unlikely to Present Acute Hazard in Normal Use**

| | |
|---|---|
| Lethal Dose for Rats By Oral Route: LD50 | 4873 mg/kg |
| Lethal Dose for Rabbits By Dermal Route: LD50 | 7940 mg/kg |

**Hazards:**

Specific –

- Acute: eye irritation (PAY Dec 1986) and inflammation. (NCAP)
- Chronic: may cause renal tubule adenomas (gland-like benign tumors). (PAY, Oct 1985) Glyphosate may include N-nitrosoglyphosate (NNG) as a trace contaminant, or the compound may be formed in the environment when combined with nitrate (present in human saliva or fertilizer). The majority of N-nitroso compounds are carcinogenic. (NCAP)

**Environmental Effects:**

Glyphosate remains active in soils that do not adsorb it readily and is phytotoxic.

| | |
|---|---|
| **Main Use:** | Herbicide |
| **Specific/Other Uses:** | A foliar applied, translocated herbicide, it controls many annual and perennial grasses and broad-leaf weeds as well as many tree and woody brush species in cropland and noncrop sites. (FCH) |

**Remarks:**

Of 143 pesticides reported for causing human illness in California in 1986, glyphosate was fourth in the number of accidents reported. (NCAP) Formulations of glyphosate are one of the leading causes of contact dermatitis reported in occupationally exposed agricultural workers in California (JAMA 89).

Minute quantities of glyphosate can cause severe damage to crops, plants or other areas on which treatment was not intended. This was noted in a Monsanto label guide for Roundup. (NCAP)

## Regulatory Control In Some Countries

| Country | Effective Date | Description of Action Taken/Grounds for Decision |
|---|---|---|
| CAN | | Glyphosate is not yet registered for direct application. (eg dessicant use). (CANADA) |
| GBR | | Approved for use, wear protective gloves and faceshield when handling the concentrate. (PUHSH) |
| USA | | Glyphosate is only conditionally registered (ie. only part of the test required in 1972 by Congress for pesticide registration have been submitted). (NCAP) |

## References:


CANADA: "Cooperative Glyphosate Investigation Concern About Pre-harvest Use". Canada 90-15, Product Management Division, Agriculture Canada, Ottawa, 12 October, 1990.

FCH: Farm Chemicals Handbook, Meister, Willoughby, Ohio, 1989

JAMA 89: "Lyphosate Herbicide Toxicity", Journal of American Medical Association, Vol. 261, no. 17, May, 1989.

NCAP: O'Brien, Mary H., Roundup, Northwest Coalition for Alternatives to Pesticides, Eugene, OR, September, 1987.

PAY Oct 1985: Pesticides and You, Vol. 5, no. 3, October, 1985.

PAY Dec 1986: Pesticides and You, Vol. 6, no. 5, December, 1986.

PUHSH: Watterson, Andrew. Pesticide Users Health and Safety Handbook: An International Guide. Gower Technical, Aldershot, U.K., 1988.

# DALAPON

**Chemical Group:** Organochlorine
**Chemical Name:** 2,2-dichloropropionic acid
**CAS Number:** 127-20-8

**Some Trade Names:**

| | |
|---|---|
| Ancopon 85 | **Dowpon MS Grasskiller** |
| Atlas Lignum | Fydulan |
| Basfapon | Gramevin |
| Basfapon N | Grass Killer |
| BM Dalapon | Rasinox |
| BH Total | Synchemicals Couch |
| Crisapon | Unipon |
| Destral | Volunteered |
| Devipon | |

**WHO Recommended Classfication By Hazard:**
Class IV
Lethal Dose for Rats by Oral Route: LD50 970 mg/kg

**Hazards:**

Specific

- Acute: Some evidence of skin and eye irritation.
- Chronic: Some animal evidence of effects on the kidney

**Environmental Effects:**

Do not contaminate water as a general precaution. Dangerous for fish.

**Main Use:** Herbicide
**Specific/Other Use:** Post-emergence on crops and grasses, potatoes, sugar-beet, carrots, oil seed rape and control of reeds and sedges as an aquatic herbicide.

**Remarks:**

In UK avoid spray drift, take off heavily contaminated clothing immediately, wear protective gloves when handling granules, wash dust and splashes from the skin and eyes immediately, do no breathe dust and wear a dust mask if necessary, wash hands and exposed skin before meals and after work. USA EPA signal work: 'caution'. (PUHSH)

## Regulatory Control in Some Countries

| Country | Effective Date | Description of Action Taken/Grounds for |
|---|---|---|
| UK | 1986 | Approved for use. (FCH) |

**References:**


FCH: Farm Chemicals Handbook, Meister, Willoughby, Ohio, 1989.

PUHSH: Watterson, Andrew, Pesticide Users Health and Safety Handbook. An International Guide, Gower Technical, Aldershot, U.K., 1988.

## Dirty Dozen

# PARAQUAT*

**Chemical Group:** Dipyridyls
**Chemical Name:** 1,1'-Dimethyl-4,4'-bipyridinium ion
**CAS Number:** 4685-14-7

**Some Trade Names:**

| | |
|---|---|
| Actor | Paraquat 50% |
| Bladex | Paraquat Dichloride 24% |
| Cekuquat | Pathclear |
| Crisquat | Pillarquat |
| Dextrone | Pillarxone |
| Dexuron | Polyzone 24 |
| Esgram | Preeglone |
| Goldquat 276 | Priglone24 |
| Gramonol | Princep |
| **Gramoxone** | Simpar |
| Herboxone | Terraklene |
| Herbaxone | Tota-col |
| Methylviologen | Total Toxer |
| Mofisal | Toxer Total |
| Paraquat | Weedol |
| Paraquat 35% | |
| Paraquat 42% | |

**WHO Recommended Classification By Hazard:**
**Solid: Class II: Moderately Hazardous**

| | |
|---|---|
| Lethal Dose For Rats By Oral Route: LD50 | 100 mg/kg |
| Lethal Dose For Rabbits By Dermal Route: LD50 | 236 mg/kg |

* Anion present must be stated e.g., paraquat dichloride or paraquat di-methylsulphate.

**Hazards:**

Specific –

- Acute: very high toxicity; oral ingestion is most serious, but skin penetration and respiration or absorption are also hazardous. Absorption across intact skin is slow, but abraded or broken skin allows efficient absorption. Initially causes severe irritation to the mucuous membranes of the mouth and throat, difficulty in swallowing, vomiting, abdominal discomfort and diarrhoea. Paraquat is a powerful skin irritant. Delayed pulmonary and renal fibrosis (scarring) are irreversible and may be fatal after as little as one teaspoon is ingested. (DD90, Greenpeace)
- Chronic: Mutagen (EPA); Long-term skin contact may cause blisters and ulcers, increasing paraquat absorption enough to cause systemic and even fatal poisoning. Long-term inhalation of spray droplets may cause nose bleed. Eye contamination can damage the cornea and cause long-lasting or permanent blindness. (DD90)

**Environmental Effects:**

One of paraquat's degradation products, QINA chlorida, does not bind well to soil and therefore is a potential groundwater contaminant. (DD90)

Paraquat is moderately toxic to birds and aquatic invertebrates and slightly toxic to freshwater fish. It has been shown to have significant adverse effects on certain stages of bird reproduction. (DD90)

**Main Use:** Herbicide

**Specific/Other Uses:** It is a contact herbicide widely used in agriculture and horticulture. Defoliant, dessiccant, plant growth regulator. (EPA)

**Remarks:**

Paraquat is estimated to claim about 100 lives annually in Papua New Guinea. (IRPTC 4/82)

In Malaysia, between 1977-1981, there were 310 paraquat poisoning cases and of these 246 died. (Amarasingham)

There is no effective antidote or treatment for severe paraquat poisoning. Most fatal paraquat poisonings are suicidal, although accidental ingestion and absorption through damaged skin also cause many intentional systemic poisonings and deaths. In Malaysia, a 1986 government report found that paraquat caused more poisonings and more deaths than any other pesticide. Surveys conducted by Sahabat Alam Malaysia (Friends of the Earth Malaysia) in 1981 and 1982 estimated 1,200 paraquat deaths a year in that country, most of them suicides. In Japan, an estimated 1,300 suicides a year involve paraquat. A recent national survey in Costa Rica found that paraquat caused 71 percent of recorded fatal pesticide poisonings (both accidental and suicidal). (DD90)

While paraquat manufacturers claim that they are not responsible for unintended uses of

their products, the World Health Organization (WHO) and many others have argued that paraquat's easy availibility increases the rate of suicide deaths. Efforts to stop suicidal use of paraquat via education, or by adding blue dye, an odour, and an emetic to the pesticide have had uneven results. (DD90)

Low-level paraquat poisoning, especially damage to the skin and nails, is common among workers in many countries. In Colombia, there is a saying: "If a worker's nails do not fall out, it is because he is not working well." (DD90)

## Regulatory Control In Some Countries

| Country | Effective Date | Description of Action Taken/Grounds for Decision |
|---|---|---|
| BGD | | Registered only for use in plantation crops. (ADB 87) |
| BRA | | Use in agriculture: authorized; use in domestic sanitation: not authorized. (IRPTC 3/88) |
| DEU | May 1986 | Use prohibited: 1) in cultivation of cereals; 2) in water (lakes, rivers, etc.) in protected water areas. (IRPTC 3/88) |
| FIN | Aug 1986 | Use banned because of high acute toxicity. (CLP3) |
| GBR | Jan1986 | Paraquat use is subject to the following restrictions: sales and record keeping (Jan 1986), labelling, storage, and transport (Apr 1982). (IRPTC 3/88) |
| HUN | 1985 | The active agent is permitted only if it contains an emetic and is coloured blue. (CLP3) |
| IDN | | Virtually all registered uses have been prohibited but certain specific registered uses remain authorized. (ADB 87) (PAN Ind) |
| ISR | 1963 | Due to the compound's high acute mammalian toxicity, it is subject to labelling requirements, and formulations are required to contain an emetic and a distinguishing color. (CLP3) |
| LKA | | A periodic review required. (PRO 91) |

| Country | Effective Date | Description of Action Taken/Grounds for Decision |
|---|---|---|
| MYS | | Paraquat must contain a stenching agent to prevent mistaken consumption. (Balasubramaniam 1974) (ADB 87) |
| NOR | 1981 | The product has been voluntarily withdrawn from the market. (CLP3) The Pesticides Board was on the verge of withdrawing the product because of toxicity and causing incurable damage to lungs. (LDG) |
| NZL | 1983 | Under the Toxic Substances Act, liquid preparations and solid preparation containing five percent or more of this product are restricted to commercial users and are labelled "dangerous poison". Other solid preparations are labelled "poison". Under the provisions of the Pesticides Regulations (1983) a "suitable" emetic and stenching agent must be added to this product. (CLP3) |
| PHL | | Considered too hazardous for general use. Restricted to institutional use. Approval of use will be based on strict compliance by the importer/end user of the requirements set for its use. (FPA) |
| PNG | | All preparations sold now contain an emetic and stenching agent in an attempt to reduce the fatality rate from accidental and deliberate ingestion. (IRPTC 4/82) Registration of paraquat is dependent on product having a Tok Pisin (local language of PNG) label approved by the Pesticide Registrar. (UPNG) |
| SWE | Dec 1983 | Banned because of its high acute toxicity and irreversible effects. (CLP3) |
| USA | Jun 1987 | The Environmental Protection Agency has placed the following restrictions on paraquat use: 1) an emetic must be incorporated into all manufacturing-use products and end-use products. 2) Agricultural products are classified as "Restricted Use" and precautionary statements are necessary to protect mixer-loaders and applicators from effects of dermal toxicity. 3) labels must be revised pertaining to application and grazing restrictions, and to protect endangered species. (EPA) In 1982, a special review of paraquat based on emergency treatment and chronic effects led to voluntary cancellation of certain noncrop sites. (Status) |

| Country | Effective Date | Description of Action Taken/Grounds for Decision |
|---|---|---|
| WSM | | Virtually all registered uses have been prohibited but certain specific registered uses remain authorized. One of the first countries to require that paraquat have both an emetic and a stench. (ADB 87) |

**References:**


ADB 87: Handbook on the Use of Pesticides in the Asia-Pacific Region, Asian Development Bank, Manila, 1987.

Amarasingham: Amarasingham, R.D. and A.S. Lim, A Review of Cases of Human Poisonings Recorded from 1977-1981, Toxicology Division of the Department of Chemistry, Petaling Jaya, Malaysia, n.d.

Balasubramaniam 1974: Pesticides Act 1974, A. Balasubramaniam, Senior Agricultural Officer, (Pesticides) Department of Agriculture, Ministry of Agriculture, Malaysia.

CLP3: Consolidated List of Porducts Whose Consumption and/or Sale have been Banned, Withdrawn, Severely Restricted or Not Approved by Governments, 3rd. issue, United Nations, New York, 1989.

DD90: Dirty Dozen Pesticides Fact Sheets, PAN North America Regional Center, San Francisco, 1990.

EPA: U.S. Environmental Protection Agency, "Paraquat" Fact Sheet, no. 131, 18 June, 1987.

FPA: Letter from the Fertilizer and Pesticide Authority, Philippines, dated 2 January, 1990 to IOCU Regional Office for Asia and the Pacific, Penang, Malaysia.

Greenpeace: Barclay, William, "Review of The Pesticide Paraquat for Submission to the World Bank Pesticide Advisory Panel, 6-7 December, 1989", Greenpeace, Washington, D.C., November, 1989.

IRPTC 3/88: International Register of Potentially Toxic Chemicals, IRPTC Legal File 1988, March, 1988.

IRPTC 4/82: International Register for Potentially Toxic Chemicals, IRPTC Bulletin, Vol. 5, no. 1, April, 1982.

LDG: Letter from Landbruksdepartementets Giftnemnd, Finland, dated 16 November, 1989 to IOCU Regional Office for Asia and the Pacific, Penang, Malaysia.

PAN Ind: Letter from PAN Indonesia, dated 31 December, 1990 to IOCU Regional Office for Asia and the Pacific, Penang, Malaysia.

PRO 91: Letter from the Pesticide Registration Office, Sri Lanka, dated 17 January, 1991 to IOCU Regional Office for Asia and the Pacific, Penang, Malaysia.

Status: U.S. Environmental Protection Agency, Office of Pesticide Reform, Report on the Status of Chemicals in the Special Review Program, Registration Standards Program, and Data Call-In Program, Washington, D.C., September, 1987.

UPNG: Information from the University of Papua New Guinea, dated 4 January, 1991 to IOCU Regional Office for Asia and the Pacific, Penang, Malaysia.

# EBDC's*

**Chemical Group:** Dithiocarbamates

**Chemical Name:** Ethylene bisdithiocarbamates (general)

| Selected Common Names: | CAS No: | Some Trade Names: |
|---|---|---|
| Ferbam | 14484-64-1 | Fermate<br>Fuklasin<br>Hokmate<br>Karbam Black<br>Niacide |
| Mancozeb | 8018-01-7 | Aazimag<br>Fore<br>Dithane M-45<br>Manzate 200 |
| Maneb | 12427-38-2 | Amazin<br>Blitex<br>Dithane M-22<br>Manzate<br>Martemick<br>Mancid<br>Tubothane |
| Metam-sodium | 137-42-8 | Carbam<br>Masposol<br>Sistan<br>Trapex<br>Vapam |
| Metiram | 9006-42-2 | Zine-metiram<br>**Polyram** |
| Nabam | 142-59-6 | Nabasan<br>Parzate<br>Spring-Bak |
| Propineb | 12071-83-9 | Antracol<br>Cypromate<br>Mezineb |
| Thiram | 137-26-8 | Arasan |

*(cont'd next page)*

* The EBDC's are a group of chemicals with similar chemical, toxicological, and pesticidal properties.

| Selected Common Names | CAS No: | Some Trade Names: |
|---|---|---|
| | | Cyuram<br>Fernasan<br>Mercuram<br>Normersan<br>TNTD |
| Zineb | 12122-67-7 | Aspor-Z<br>Carbane<br>Dithane-278<br>Lonacol<br>Murphane<br>Novozir<br>Parzate<br>Perozine 75B<br>Sudothane<br>Zebenide<br>Zelmone |
| Ziram | 137-30-4 | Cuman<br>Fuklasin<br>Milbam<br>Zerlate |

**WHO Recommended Classification By Hazard:**

**Solid: Class II, and III: Moderately hazardous** (nabam and metam-sodium), **Slightly hazardous** and/or **unlikely to present acute hazard in normal use.**

| | |
|---|---|
| Lethal Dose for Rats By Oral Route: LD50 | 395-12,800 mg/kg |
| Lethal Dose for Rat By Dermal Route: LD50 | >1000 - 2000 mg/kg |

**Hazards:**

Specific –

- Chronic: A common contaminant, metabolite, and degradation product - ethylene thiourea (ETU) – is a probable human carcinogen. The EBDC's and ETU are suspect carcinogens and may cause birth defects and genetic mutations. (PA)

**Environmental Effects:**

Generally low acute toxicity to mammals but high acute toxicity to fish. Low bioaccumulation; several dithiocarbamates were shown to intervene with testicular development and function and neurotoxicological problems in domestic fowl. (EHC 78)

**Main Use:** Fungicides

**Specific/Other Uses:** Some insecticidal and herbicide uses. Thiram is chemically similar to the drug disulfiram (Antabuse) used as a treatment for chronic alcoholism. Thiram is also used in the rubber industry. (PAY)

**Remarks:**

Over 37,270,000 kgs consumed worldwide per year (EHC 78). The EBDC's are the most widely used group of fungicides in the U.S. These chemicals comprise approximately 22 percent of all fungicides used in the U.S. and 57 percent of the total fungicide used worldwide. (PA)

ETU residues are known to concentrate in processed or cooked food that has been treated with an EBDC fungicide. (PAY)

## Regulatory Control In Some Countries

| Country | Effective Date | Description of Action Taken/Grounds for Decision |
|---|---|---|
| BLZ | | Metham sodium restricted for use as a soil fumigant. (CLP3) |
| DEU | May 1986 | Metham-sodium prohibited in protected water areas (with certain exceptions), and in natural parks or preserves. (CLP3) |
| SUN | | Maneb prohibited for use in agriculture. (CLP3) |

| Country | Effective Date | Description of Action Taken/Grounds for Decision |
|---|---|---|
| USA | Feb 1990 | All zineb products registered for agricultural uses are either suspended for failure to submit data to the Agency, or cancelled.<br>All nabam products registered for agricultural uses are either suspended for failure to submit data to the Agency or have had their registrations amended to delete agricultural food uses from the product labels.<br>The following crop uses are retained:<br>**Maneb:** Almonds, bananas, potatoes, sugar beets, and sweet corn<br>**Metiram:** Potatoes<br>**Mancozeb:** Asparagus, bananas, cranberries, figs, grapes, onions, peanuts, potatoes, sugar beets, sweet corn, tomatoes and wheat. (SCRP) |

**References:**


CLP3: Consolidated List of Products Whose Consumption and/or Sale have been Banned, Withdrawn, Severely Restricted or Not Approved by Governments, 3rd. issue, United Nations, New York, 1989.

EHC 78: International Programme on Chemical Safety, Dithiocarbamate Pesticides, Ethylene thiourea, and Propylene thiourea: A General Introduction, Environment Health Criteria 78, World Health Organization, Geneva, 1988.

PA: Mott, Lawrie and Snyder, Karen, Pesticide Alert: A Guide to Pesticides in Fruits and Vegetables, Natural Resources Defense Council, Sierra Club Books, San Francisco, 1988.

PAY: "EBDC Fungicides," chemicalWATCH Factsheet, Pesticides and You, Vol. 8, no. 2, June, 1988.

SCRP: Suspended, Cancelled and Restricted Pesticides, U.S. Environmental Protection Agency, Washington, D.C., 1990

## Dirty Dozen

# LINDANE

**Chemical Group:** Organochlorine
**Chemical Name:** 1,2,3,4,5,6,-Hexachlorocylohexane (not less than 99% gamma isomer)
**CAS Number :** 58-89-9

**Some Trade Names:**

| | | |
|---|---|---|
| AA-Fleur Super | Gammexane | Prosem |
| Aaritna | Germate | Quinolate MG FL |
| Agriscab | Granol | Saindane 90 |
| Agrocide 2 | Hazafor | Scabicurin |
| Agronex | Hexablanc | Shell Lindane 21% |
| Agronex-Spezial | Hexapoudre | Soldrex 2 |
| Agronexa-Emulsionable | Isotox | Submar |
| Agronexa SL Espolv | Lacco Hi Lin | Sylvogam |
| Agronexa SL PM | Lacco Lin-O-Mulsion | Tebuzate Triple |
| Agronexit | Lindafor | Temik LD |
| Agrox D-L Plus | Lindalo | Terlin 3G |
| Agrox 3-Way | Lindamul | Top Borkenkaefermittel Schering |
| Ameisen-Ex | Lindane 2G | Trimisen |
| AN 69 | Lindapoudre | Umagam |
| Arcotin | Lin-O-Sol | Umuxebe Double |
| Benzex | Manegam | Ungeziefer Mittel Jacutin Fluessig |
| Certan | Manolate Triple | Velan D |
| Cuprolate MG Liquide | Mergamma P | Verdegamma Inodoro |
| Exagama | Nexit | Zaprawa Nasienna GTS |
| Forlin | Novigam | |
| Gamahex | Para-Weiss | |
| Gammex | Prodactif | |

**WHO Recommended Classification By Hazard:**

**Solid: Class II: Moderately Hazardous**

| | |
|---|---|
| Lethal Dose For Rats By Oral Route: LD50 | 76 mg/kg |
| Lethal Dose For Rats By Dermal Route: LD50 | 500 mg/kg |

**Hazards:**

Specific –

- Acute: high toxicity and skin rashes. (DD90)
- Chronic: central nervous system effects, liver and kidney damage, aplastic anaemia, embryotoxic, suspect carcinogen. (IRPTC 1/80)

**Environmental Effects:**

Residues of HCH and lindane have been found worldwide, even in areas far from any application site, such as the Arctic and Antarctica. Recent studies have demonstrated that evaporation and air transport of lindane play a major role in environmental contamination. A German study demonstrated lindane evaporation levels from various crops of 76-90 percent within 24 hours of application. A study of lindane fluxes in part of the Federal Republic of Germany found that far more lindane is moved by the atmosphere than by rivers. High and even dramatically increasing levels of lindane contamination have been detected in European rainwater in the 1980s. Lindane and its degradation products have the potential to contaminate surface and groundwater. (DD90)

Lindane is highly toxic to some aquatic organisms, honey-bees, and certain beneficial parasites and predacious insects. (EPA)

**Main Use:** Insecticide

**Specific/Other Uses:** Acaricide, seed treatments

**Remarks:**

Lindane is used on food crops, in forests, for seed treatment, in veterinary products, and to kill household pests, and head lice. In Ghana, it was used for fishing by villagers with no knowledge of its health effects, who dumped it into Lake Volta and gathered the fish that floated to the surface. Resulting human poisonings and fish population declines were not connected with lindane use until a successful public education campaign began. 'Fishing' with lindane and other pesticides has been reported in many other countries as well. (DD90)

Lindane production creates massive pollution problems. For every ton of lindane (gamma-HCH) produced, over five tons of toxic, persistent HCH isomers are produced as waste products. (DD90)

HCH is commonly detected in human fat and breast milk in many countries. In India, a major manufacturer and user of HCH, high residue levels occur in humans and the environment. One university study found 70 percent of breast milk samples and 95 percent of cow's milk samples contaminated in excess of the tolerance limit. An Indian newspaper reported in 1986 that HCH residue levels in Indian food were the highest in the world. (DD90)

In Europe, HCH and lindane application in transport containers and storehouses has caused widespread food contamination - lindane was found in a majority of bread samples from conventional farm operations. (DD90)

Contamination levels in the North Sea and continental rainwater have been rising in the 1980s, and often exceed government-determined acceptable levels. Lindane accumulation in animal tissues also has been demonstrated, at levels up to one million times the concentration in surrounding water for higher marine organisms. (DD90)

## Regulatory Control In Some Countries

| Country | Effective Date | Description of Action Taken/Grounds for Decision |
|---|---|---|
| ARG | Jun 1972 | Prohibited as anti-weevil agent in treatment of seeds and seed products intended for human and animal consumption (Jun 1972). Also prohibited in cultivation, commerce and industrial processing of tobacco (Dec 1971). (CLP3) |
| BEL | | Prohibited according to EEC Directive 79/117. Agricultural use restricted to treatment of ground or seeds to combat ground insects. (IRPTC 3/88) |
| BGD | | All registered uses have been prohibited by final government regulatory action. (ADB 87) |
| BGR | | Banned for use in agriculture. (CLP3) |
| BLZ | | Lindane is a prohibited pesticide. It shall not be brought into use in Belize. Its possible effects on the environment, plants, animal or human beings are considered to be too dangerous to justify its use. (IRPTC 3/88) (CLP3) |
| BRA | | Use in agriculture: authorized use in domestic sanitation: not authorized. (IRPTC 3/88) |
| CAN | 1970 | Some restrictions have been made in the use of this product and it is currently used only as a seed dressing, for soil treatments on limited number of crops and for certain livestock and structural |

| Country | Effective Date | Description of Action Taken/Grounds for Decision |
|---|---|---|
| | | uses. Data supporting some uses were inadequate by modern standards, also technical advances made some uses obsolete. (IRPTC 3/88) (CLP3) |
| CHN | Jun 1982 | It is prohibited to use BHC on fruit trees, vegetables, tea, herbs, tobacco, coffee, pepper. BHC is a highly restricted persistent pesticide. Its use is harmful to human health and is therefore severely restricted. (CLP3) |
| COL | May 1978 | Prohibition of use and sale of organochlorine-containing insecticide in the cultivation of coffee either single or in combination. This restriction is based on standards set by countries importing these agricultural products. (CLP3) |
| CYP | Dec 1987 | Banned for use in agriculture. Approved for use in paints for wood protection. Banning was due to the risk associated with human health and the environment. (IRPTC 3/88) |
| DEU | Jul 1986 | Use is limited to 0.3 percent with the exception of shampoo, which may contain up to one percent since exposure time is limited to four minutes. Use prohibited in mills, in grain silos, in grain stores and grain products (May 1986). Anti-fouling paints which contain: mercury compounds, arsenic compounds, DDT, HCH, PCB, or PCT may not be used except when no substitute is available and permission is given by the appropriate authority (Oct 1980). Also prohibited for application against parasites on lactating horses, cows, sheep and goats which are used for milk production (Jan 1978). (IRPTC 3/88) (CLP3) |
| DMA | | Severely restricted pesticide. (IRPTC 3/88) (CLP3) |
| ECU | Jul 1985 | Registration and importation are prohibited because the substance is harmful to health and its manufacture, marketing or use has been prohibited in various countries. (CLP3) |
| EEC | Jan 1988 | HCH must not form part of the composition of cosmetic products. The marketing of cosmetic products containing the substance is prohibited. (IRPTC 3/88) |
| FIN | | The substance is subject to severe restrictions set by the Plant Protection Agency. Use is allowed only in few specified cases. (CLP3) |

| Country | Effective Date | Description of Action Taken/Grounds for Decision |
|---|---|---|
| HUN | Jan 1968 | Pesticides containing this substance have been withdrawn from the market and their use banned due to experimental data showing HCH residues in the fatty tissue of humans and domestic animals. Other chlorinated hydrocarbon pesticide have been banned or severely restricted since 1968. (CLP3) |
| ISR | 1956 | Approved for use in agriculture only for winter grains, legumes and vegetables for the control of locusts. Licenses for use in pediculosis and scabies treatment and in household sprays revoked in 1982. Restrictions in use due to the compound's environmental persistence and the possibility of adverse toxicological effects. (CLP3) |
| JPN | Dec 1971 | Banned for sale as a pesticide. (CLP3) |
| KEN | Apr 1985 | The use of gamma-HCH and gamma-BHC in Kenya will be restricted to lindane. Reasons for the control action: risk associated with toxicity and wide usage. (IRPTC 3/88) |
| LKA | | Severely restricted. (PRO) |
| MEX | Jul 1988 | Pesticide of restricted agricultural use for rice, barley, maize and wheat. Reasons for the control action; control of pests and its high toxicity; LD50: 76-200mg/kg. (IRPTC 3/88) (CLP3) |
| NIC | 1982 | Minstry of Agriculture has reimposed ban on benzene hexachloride (lindane). (Escape) |
| NLD | Jan 1984 | Products containing lindane are no longer accepted for the treatment of headlice infestation because of widespread development of resistent strains. They remain available for the treatment of scabies and body or pubic lice. It is prohibited to sell, stock, store or use all pesticides containing HCH (99 percent gamma isomer) as active ingredient because of the persistence of its impurities (alpha-, beta-, delta- and epsilon-isomers of HCH which do not contribute to the activity of gamma-HCH and the fact that its high bioconcentration factor leads to biomagnification in the food chain (Jan 1981). (IRPTC 3/88) (CLP3) |

| Country | Effective Date | Description of Action Taken/Grounds for Decision |
|---|---|---|
| NZL | 1983 | Under the provisions of the Toxic Substances Act, liquid formulations of this product are available to commmercial users only and must be labelled as a dangerous poison. Under the provisions of the Pesticides Regulations (1983), a permit is required before this product can be used. (CLP3) |
| PHL | | Too hazardous for general use, for institutional use only. The only allowed use is on pineapple plantations by soil preplant application. (FPA) |
| POL | | Gradually withdrawn from agriculture and sanitary hygiene. (IRPTC 3/88) (CLP3) |
| SGP | Apr 1984 | Importation and sale for local use is banned. This decision was taken to safeguard water sources. (CLP3) |
| SUN | Jun 1983 | Pesticide is prohibited in some food products. (IRPTC 3/88) Not used in cattle industry. (CLP3) |
| SWE | 1988 | The use of lindane in agriculture is banned because of its suspected carcinogenic properties and its persistence. (KEMI) |
| USA | | Cancellation of lindane-containing products for use in vapourisers, for indoor use in smoke fumigation devices, and the use of lindane products used for direct application to aquatic environment. (SCRP) Cancellation of registrations and denial of applications for registrations of lindane-containing products for all other uses unless labels contain given statements for each use. Labelling restrictions include restricting some uses to certified applicators and protective clothing requirements. EPA is requiring further data on acute toxicity, oncogenicity, blood dyscrasias (diseased state of the blood) study, environmental fate and residue chemistry (Sep 1985). (CLP3, Status, EPA) EPA requires a warning statement on labels due to carcinogenicity. (Campt) |

| Country | Effective Date | Description of Action Taken/Grounds for Decision |
|---|---|---|
| VEN | 1983 | The preparation, import, export, storage, purchase, sale and distribution of organochlorine insecticides shall be permitted only when they are intended for the following uses: 1) control of vectors for medical reasons, provided their application is carried out by the Ministry of Health and Social Welfare or under its technical advice and supervision; 2) control of agricultural pests, provided that the situation is an emergency one and that their application is carried out or directed by the Ministry of Agriculture and Stockraising; 3) control of atta sexdens and other ants, exclusively with granulated formulations containing aldrin and chlordane and in applications going directly on to the soil. 4) control of termites in formulations containing aldrin and chlordane. Organochlorine compounds pollute the environment and, owing to the persistence of residues in foodstuffs of animal and vegetable origin, are a cause of concern for public health. (IRPTC 3/88) (CLP3) |
| YUG | 1972 | It was excluded from use in agricultural produce, storages on vegetables, tobacco, forage plants, grapevines, medicinal herbs in glasshouses and plastic houses. In addition the following cannot be grown on treated area for at least two years; root vegetables, onions, potatoes, lettuce, cabbage, undehydrated forage plants, medicinal plants. For permitted uses it can be applied only once during the year. The aforementioned strict limitation does not apply to lindane for export. The severe restriction was imposed because it is persistent in soils and is not readily metabolized in plants and animals. Moreover, it adversely affects the biocenosis. (CLP3) |

## References:


ADB 87: Handbook on the Use of Pesticides in the Asia-Pacific Region, Asian Development Bank, Manila, 1987.

Campt: Douglas Campt, Director, Office of Pesticides Programs, U.S. Environmental Protection Agency, letter to Albert Meyerhoff, Natural Resources Defense Council, 17 February, 1987.

CLP3: Consolidated List of Products Whose Consumption and/or Sale have been Banned, Withdrawn, Severely Restricted or Not Approved by Governments, 3rd. issue, United Nations, New York, 1989.

DD90: Dirty Dozen Pesticides Fact Sheets, PAN North America Regional Center, San Francisco, 1990.

EPA: U.S. Environmental Protection Agency, "Lindane Fact Sheet," No. 73, Washington, D.C., 30 September, 1985.

Escape: Hansen, Michael, Escape From The Pesticide Treadmill: Alternatives to Pesticides in Developing Countries, Institute for Consumer Policy Research, Consumers Union, published by the IOCU and Pesticide Action Network, Penang, Malaysia, 1987.

FPA: Letter from the Fertilizer and Pesticide Authority, Philippines, dated 2 January, 1990 to IOCU Regional Office for Asia and the Pacific, Penang, Malaysia.

IRPTC 3/88: International Register of Potentially Toxic Chemicals, IRPTC Legal File 1988, March 1988.

IRPTC 1/80: International Register of Potentially Toxic Chemicals, IRPTC Bulletin, Vol. 3, no. 1, January 1980.

KEMI: Letter from KEMI (National Chemical Inspectorate), Sweden, dated 22 February, 1990 to IOCU Regional Office for Asia and the Pacific, Penang, Malaysia.

PRO: Letter from the Pesticide Registration Office, Sri Lanka, dated 23 March, 1989 to Greenpeace, Washington, D.C., USA.

SCRP: Suspended, Cancelled and Restricted Pesticides U.S. Environmental Protection Agency, Washington, D.C., 1990.

Status: U.S. Environmental Protection Agency, Office of Pesticide Program, Report on the Status of Chemicals in the Special Review Program, Registration Standards Program, and Data-Call-In Program, Washington, D.C., September 1987.

# AMITRAZ

**Chemical Group:** Nitrophenolic
**Chemical Name:** n-methyl bis (2,4-xylyliminomethyl) amine
**CAS Number:** 33089-61-1

**Some Trade Names:**

| | | |
|---|---|---|
| Acarac | Azadieno | **Mitac 20** |
| Acarex 20 | Bumetran | Mitac |
| Amitraz Estrella | Edrizar | Taktic |
| Asepta Tetranyx | Foracren 20 EC | |

**WHO Recommended Classification By Hazard:**

Class III Slightly Hazardous

| | |
|---|---|
| Lethal Dose for Rats by Oral Route: LD50 | 200 mg/kg |
| Lethal Dose for Rats by Dermal Route: LD50 | >1600 mg/kg |
| Lethal Dose for Rabbits by Dermal Route: LD50 | >200 mg/kg |

**Hazards:**

Specific

- Acute: moderately toxic.
- Chronic: 'weak' carcinogen in some tests.

**Environmental Effects:**

Not very toxic to honeybees. Harmful to fish

**Main Use:** Insecticide, acaricide

**Specific/Other Use:** Control of red spider mite on apple and pear sucker, also used against scale insects, mealy bugs and aphids, tick, mite and lice control in cattle, dogs, goats, pigs and sheep.

**Remaks:**

In California workers are required to stay out of treated fields until spray dust has dried or settled. In the UK, it is advised to avoid all contact by mouth. Wash hands and exposed skin after work and before eating, drinking or smoking. Wear proper protective clothing. In the USA signal word is 'warning'.

## Regulatory Control In Some Countries

| Country | Effective Date | Description of Action Taken/Grounds for Decision |
|---|---|---|
| ARG | June 1990 | Registration of liquid formulations. (PUHSH) |
| GBR | 1986 | Approved for use with special controls which require that the operator wear a faceshield, overalls and rubber gloves for opening and mixing the chemical as a liquid or wettable powder. (PUHSH) |
| USA | 1979 | Conditional registration for use on pears. Must be labelled as a restricted use pesticide. For retail sale to and use under their direct supervision. Reentry into treated area at least 24 hours after application. Scientific review by the EPA confirmed that amitraz induces cancer in laboratory animals. (CLP3) |

**References:**

CLP3: Consolidated List of Products Whose Consumption and/or Sale have been Banned, Withdrawn, Severely Restricted or Not Approved by Governments, 3rd. issue, United Nations, New York, 1989.

PUHSH: Watterson, Andrew, Pesticide Users Health and Safety Handbook: An International Guide, Gower Technical, Aldershot, U.K., 1988.

# WARFARIN (R)

**Chemical Group:** Coumarin
**Chemical Name:** 4-hydroxy-3-(3-oxo-1-phenylbutyl) coumarin
**CAS Number:** 81-81-2

**Some Trade Names:**

| | |
|---|---|
| AA Rat Bait | |
| Buah Emas | K Willard Rat Bait |
| Butik | King Kong Rat Bait |
| DC 10 | Racusun |
| **Deb-R Racun Tikus** | Rat Bait RK 9 |
| Ebor Baits | Tikumin Super |
| Habis Tikus | Warfarin Concentrate 1% |
| K warfarin | Yasomin |

**WHO Recommended Classification By Hazard:**

Class IV Slightly Hazardous

Lethal Dose for Rats by Oral Route: LD50 10 mg/kg

**Hazards:**

Specific

- Acute: High inhalation toxicity. Poisoning symptoms include blood in urine, back pain, bruising on arms and legs, bleeding lips and nose, abdominal pain, mucous membrane irritation, vomiting, caecal blood, rashes caused by bleeding into the skin, abnormal blood condition.
- Chronic: Experimental animal teratogen.

**Main Use:** Rodenticide

**Specific/other Use:** An anti-coagulant rodenticide. Control of rats and mice

**Environmental Effects:**

A little dangerous to humans and domestic animals when used as directed, but care must be taken with young pigs, which are especially susceptible. Bees - prepared bait (0.13 percent) not toxic to bees when used as prescribed.

**Remarks:**

In UK, avoid contact by mouth, wash hands and exposed skin before meals and after work, wear rubber/PVC gloves when handling liquid or gel.

US EPA signal word is 'caution' for low concentrates, 'danger' for high and technical concentrates. Avoid contact with mouth, eyes and skin. Store away from heat and open flames.

In Vietnam, in 1983, an estimated 250 infants were killed after someone put warfarin deliberately, into talcum powder. The talc was put onto the cut umbilical cord of newborn babies by their mothers to stop bleeding and irritation. But instead of stopping the bleeding, the warfarin in the talc made the children bleed all the more, causing many to die. (PH)

## Regulatory Control In Some Countries

| Country | Effective Date | Description of Action Taken/Grounds for Decision |
|---|---|---|
| GBR | 1986 | Approved for use. (PUHSH) |

**References:**

PH: Hurst, Peter; Hay, Alastair and Dudley, Nigel: The Pesticide Handbook, 1991.

PUHSH: Watterson, Andrew, Pesticide Users Health and Safety Handbook: An International Guide, Gower Technical, Aldershot, U.K., 1988.

# DIMETHOATE

**Chemical Group:** Organophosphate
**Chemical Name:** O,O-dimethyl S-(N-methylcarbamoyl-methyl) phosphorodithioate
**CAS Number:** 60-51-5

**Some Trade Names:**

Bio Long Last
Blackfly Killer (Boots)
Boots Greenfly
Celamerck Roxion
Cygon Insecticide
Doff Systemic Insecticide
Fisons Greenfly and Blackfly Killer
Flora Spray Systemic Insect Killer
Flower Spray
Fungicide Rose
Keriguards
Lurgo
Murphy Systemic Insecticide
**Rogor**
Rogor E
Recusan
Secto Garden Powder
Secto Systemic Garden Insect Killer Concentrate
Systoate
Systemic Insecticide
Tubair Systemic Insecticide
Unicrop Systemic Insecticide

**WHO Recommended Classification By Hazard:**

Class II: Moderately toxic

| | |
|---|---|
| Lethal Dose for Rats by Oral Route: LD50 | 250 mg/kg |
| Lethal Dose for Rabbits by Oral Route: LD50 | 40-500 mg/kg |

**Hazards:**

Specific

- Acute: The insecticide inhibits cholinesterase. Very toxic orally. Eye irritant in manufacture.
- Human Absorption Routes: Readily absorbed by the gastrointestinal tract and to a lesser extent through the intact skin and by inhalation.

**Environmental Effects:**

The chemical is highly toxic to bees. Birds treated in the feeding area may be killed. Harmful to fish, livestock, game, wildbirds and animals.

**Main Use:** Insecticide

**Specific/Other Use:** It is a broad spectrum contact and systemic organophosphorous insecticide used on corn, wheat soybeans, fruit, rice, tea, tobacco, sorghum, and cotton in America. Especially effective in houseflies and diptera of medical importance. It is non-phytotoxic at recommended rates except to a few olive, citrus, figs and nut varieties.

**Remarks:**

In the UK, it is recommended that if under medical advice not to use anti-cholinesterase compounds then dimethoate should not be used. Proper protective clothes should be used when handling liquid or solid concentrate, keep off skin, wash concentrate from eyes and skin immediately, avoid working in spray mist, wash hands and exposed skin before meals and after work, keep away from pets and children.

U.S. EPA signal word, 'warning'. Harmful or fatal if swallowed, inhaled or absorbed through the skin. Do not get in eyes, on skin or clothing, do not breathe dust, use with adequate ventilation. Generally wear impervious boots, gloves, body-covering clothes, respirator and wide-brimmed hat. In California, stay out of treated fields until spray has dried or dust has settled, and in fields of grapes and citrus fruits stay out of fields for 4 days. (ADB 87)

## Regulatory Control In Some Countries

| Country | Effective Date | Description of Action Taken/Grounds for Decision |
|---|---|---|
| CYP | Nov 1982 | Registration of dust formulations withdrawn by the Pest Control Products Board due to possible health risks. This decision was based on that of EPA of the USA. (PUHSH) |
| GBR | | Approved for use under the 1986 Pesticides Regulations |
| LKA | | Restricted because of toxicity. (PUHSH) |
| SUN | | Daily exposure should not exceed 4 hours. |
| USA | May 1982 | In California there is a requirement that workers stay out of treated fields until spray has dried or dust has settled. The EPA has determined that dimethoate poses risks of mutagenic, reproductive and fetotoxic effects and that the risks of oncogenic effects warrant further investigations. In 1981, EPA cancelled all dust formulations of dimethoate and has continued to unconditionally deny all applications for that type of registration. For all other uses of dimethoate, special clothings and equipment for applicators is now mandatory. (CLP3) |

**References:**


ADB 87: Handbook on the Use of Pesticides in the Asia-Pacific Region, Asian Development Bank, Manila, 1987.

CLP3: Consolidated List of Products Whose Consumption and/or Sale have been Banned, Withdrawn, Severely Restricted or Not Approved by Governments, 3rd. issue, United Nations, New York, 1989.

PUHSH: Watterson, Andrew, Pesticide Users Health and Safety Handbook: An International Guide, Gower Technical, Aldershot, UK, 1988.

# CARBARYL

**Chemical Group:** Carbamate
**Chemical Name:** 1-Naphthyl methylcarbamate
**CAS Number:** 63-25-2

**Some Trade Names:**

Aarupsin 50% Spritpoeder
Aesse
Bavin 85
Carbamin
Carbodin
Carbomatil
Denapon
Dicarbam
Dorital
Fruttal
Hexavin
Karbaspray
Laivin 85
Nac
Ravyon
Septene
**Sevin Mixed**
Tercyl
Tricarnam

**WHO Recommended Classification By Hazard:**

**Solid: Class II: Moderately Hazardous**

| | |
|---|---|
| Lethal Dose For Rats By Oral Route: LD50 | 230 mg/kg |
| Lethal Dose For Rats By Dermal Route: LD50 | 4000 mg/kg |

**Hazards:**

Specific –

- Chronic: possible adverse kidney effects, possible mutagen. (PA) Possible reproductive effector. (RTECS 89)

**Environmental Effects:**

Extremely toxic to honeybees, aquatic invertebrates and certain estuarine organisms. (EPA)

| | |
|---|---|
| **Main Use:** | Insecticide |
| **Specific/Other Uses:** | For use on many crops, including citrus, fruit forage crops, lawns, nuts shade trees. (FCH) Also used for the treatment of Pediculosis capititis (head lice). |

## Regulatory Control In Some Countries

| Country | Effective Date | Description of Action Taken/Grounds for Decision |
|---|---|---|
| BGD | | When combined with BHC, all registered uses have been prohibited by final government regulatory action. (ADB 87) |
| BRA | | Maximum concentration of the active substance authorized for sale and use as insecticide in domestic sanitation: 2.5-5 percent (wt/wt) Use for fumigation not permitted. (IRPTC 3/88) |
| DEU | Apr 1986 | Prohibited for use as a plant protectant. (IRPTC 3/88) (CLP3) |
| IDN | Nov 1986 | Banned for use on rice due to adverse effects on brown planthopper predators. (Pres 86) |
| SUN | Jun 1983 | Pesticide is prohibited in some food products. (IRPTC 3/88) |
| USA | Dec 1980 | Carbaryl was returned to the registration process following a Special Review based on evidence of carcinogenicity, mutagenicity and teratogenicity. EPA required the registrant to fill data gaps and revise labels to minimize exposure. (Status) In 1984, EPA required the registrant to submit further studies including teratogenicity, chronic toxicity, residues in food and environmental fate. (EPA) |

## References:


ADB 87: Handbook on the Use of Pesticides in the Asia-Pacific Region, Asian Development Bank, Manila, 1987.

CLP3: Consolidated List of Products Whose Consumptions and/or Sale have been Banned, Withdrawn, Severely Restricted or Not Approved by Governments, 3rd. issue, United Nations, New York, 1989.

EPA: Environmental Protection Agency, "Carbaryl" Fact Sheet, 30 March, 1984.

FCH: Farm Chemicals Handbook, Meister, Willoughby, Ohio, 1989.

IRPTC 3/88: International Register of Potentially Toxic Chemicals, IRPTC Legal File 1988, March, 1988.

PA: Mott, Lawrie and Snyder, Karen, Pesticide Alert: A Guide to Pesticides in Fruits and Vegetables, Natural Resources Defense Council, Sierra Club Books, San Francisco, 1988.

Pres 86: "Improvement of Control of Brown Planthopper (Wereng Coklat), An Insect Pest of Rice," Presidential Instruction no. 3, 1986, dated 5 November, 1986, Jakarta, Indonesia.

RTECS 89: Information made available by the Canadian Centre for Occupational Health and produced by the National Institute for Occupational Safety, Canada, 1989.

Status: U.S. Environmental Protection Agency, Office of Pesticide Program, Report on the Status of Chemicals in the Special Review Program, Registration Standards Program, and Data Call-In Program, Washington, D.C., September, 1987.

# CHAPTER 4

# The Law

**"When a statute contains no positive words guaranteeing natural justice to the affected party, the justice of the common law will supply the omission of the legislature..."**

**Cooper v. Wandsworth Board of Works**
**143 English Reports,**
**pp. 414 (1863)**

# The Law

## INTERNATIONAL CODE OF CONDUCT ON THE DISTRIBUTION AND USE OF PESTICIDES (FAO CODE) AND THE MALAYSIAN STATUTES

### FAO Code and the Malaysian Pesticides Act, 1974

The Food and Agriculture Organization (FAO) Code was adopted by the FAO Conference at its 23rd Session in 1985 by way of Resolution 10/85.

Some important features in the preface of the FAO Code are highlighted below to give an idea on why the Code was formulated.

*One of the basic functions of the Code, which is voluntary in nature, is to serve as a point of reference, particularly until such times as countries have established adequate regulatory infrastructures for pesticides.*

*The role of the exporting country needs to be considered. Much emphasis has been given recently to the desirability of regulating the export of pesticides from producing countries. It is generally accepted that no company should trade in pesticides without a proper and thorough evaluation of the pesticide, including any risks. However, the fact that a product is not used or registered in a particular exporting country is not necessarily a valid reason for prohibiting the export of that pesticide. Developing countries are mostly situated in tropical and semi-tropical regions. Their climatic, ecological, agronomic, social, economic and environmental conditions and therefore their pest problems are usually quite different from those prevailing in countries in which pesticides are manufactured and exported. The government of the exporting country, therefore, is in no position to judge the suitability, efficacy, safety or fate of the pesticide under the conditions in the country where it may ultimately be used. Such a judgement must, therefore, be made by the responsible authority in the importing country in consultation with industry and other government authorities in the light of the scientific evaluation that has been made and a detailed knowledge of the conditions prevailing in the country of proposed use.*

*While a Code of Conduct may not solve all problems, nevertheless it should go a long way toward defining and clarifying the responsibilities of the various parties involved in the development, distribution and use of pesticides. It should be of particular value in countries which do not yet have control procedures. When there is a pesticide regulatory process in a country, the need for a Code of Conduct will obviously be less than where there is no such scheme in operation.*

**Article 1.1** *of the Code states the objectives of the Code are to set forth responsibilities and establish voluntary standards of conduct for all public and private entities engaged in or affecting the distribution and use of pesticides particularly where there is no or an inadequate national law to regulate pesticides.*

**Article 3.1** *of the Code states that governments have the overall responsibility and should take the specific powers to regulate the distribution and use of pesticides in their* countries.

In Malaysia, various legislations exist with an aim to achieve this, namely:

a) The Pesticides Act 1974

b) The Pesticides (Labelling) Regulations 1984

c) Pesticides (Importation for Educational or Research Purposes) Rules 1981

d) The Pesticides (Registration) Rules 1976

e) The Pesticides (Licensing for Sale and Storage for Sale) Rules 1988

Today, there are 1300 pesticides registered in Malaysia comprising 250 active ingredients. These pesticides do not just cover agricultural pesticides but also pesticides used in factories, households and industries.

Section 7(1) of the Pesticides Act states that anyone desiring to import or manufacture a pesticide may apply to the Pesticide Board in the prescribed manner for registration of the pesticide.

An applicant, according to section 7(2), must with his application submit to the Pesticide Board the following:

a) a statement of the common name of the pesticide, if available, its trade name, its chemical name, and its structural formula, and the name and concentration of every active ingredient of the pesticide;

b) the name and concentration of every other ingredient of the pesticide;

c) detailed toxicological information on every ingredient of the pesticide and on the pesticide as a whole;

d) all matters proposed to be included in the label of the pesticide, including instructions for, and the precautionary measures to be taken in connection with, its use, and the claims made for it;

e) a statement as to, or a sample of, the proposed package of the pesticide;

f) reports on the efficacy and safety of the pesticide;

g) a statement of the methods of analysing the pesticide and of the authorities or sources of information on which the statement is based;

h) a statement of the methods of determining the residue of the pesticide on plants or crops on which it is intended to be used;

i) the addresses of the place of business of the applicant and of the place where the applicant intends to store the pesticide; and

j) if he is a manufacturer, the name and address of the factory, building, or premises at which the applicant intends to manufacture the pesticide and an outline of the process of manufacturing the pesticide.

However the requirements above are not mandatory. Section 7(4) states that the Pesticides Board may, in any particular case, waive any of the requirements. A certificate of registration will be issued if the Pesticides Board is satisfied as stated in Section (1).

a) all matters contained in and submitted with the application are true in all material particulars;

b) the matters proposed to be included in the label of the pesticide, and the proposed package of the pesticide, comply with the rules or regulations relating to labelling and packaging or, if there are no such rules or regulations for the time being, with the policy of the Board relating thereto; and

c) the pesticide, if used or handled according to the instructions contained in its proposed label, would be efficacious and would

(i) be safe to human beings and animals; or

(ii) constitute a risk to human beings and animals of such a minimal extent or degree as to be outweighed by the necessity or advantages of using the pesticide.

Section 9 lays down the period of registration of a pesticide as 3 years. However the pesticide may, on application by the applicant and on payment of the prescribed fee, be re-registered at the end of every three-year period.

The Pesticides Board may in accordance with Section 8 cancel the registration of a pesticide -

a) upon receipt of a notification in writing from the person on whose application the pesticide was registered, and on being satisfied, that the pesticide has been withdrawn from sale or use;

b) if the Board considers it undesirable that the pesticide should continue to remain registered owing to its toxicity or inefficacy;

c) if the pesticide does not conform to the claims made for it in its label;

d) if its label does not comply with the requirements of this Act or the rules or regulation;

e) if any of the conditions subject to which the pesticide is registered has not been observed;

f) if the Board finds that any of the matters submitted under section 7(2) is untrue in any material particular; or

g) if the Board is satisfied that the pesticide has fallen into disuse.

By virtue of Section 13, it is an offence for any person to import or manufacture a misbranded pesticide, or an unregistered pesticide. A pesticide is defined misbranded if -

a) its label contains a statement, design, or graphic representation relating to the pesticide that is false or misleading in any material particular, or if its package is otherwise deceptive in respect of the contents of the package;

b) it is an imitation, or is sold under the name, of another pesticide;

c) its label does not contain such warning or caution as is necessary and, if complied with, sufficient to prevent risk to human beings or animals;

d) any word, statement, information, or other matter required by the rules or regulations to appear on its label is not displayed thereon at all or in the prescribed manner;

e) it is not packed or labelled in the prescribed manner;

f) it has a toxicity that is different from that claimed for it;

g) it is mixed or packed with a substance so as to subsequently alter its original nature or quality; or

h) it contains a substance other than substance or substances that it is claimed to contain.

The offence on a first conviction is punishable with a 3 year imprisonment or a fine of $10,000 dollars. On a second and subsequent conviction, it is punishable with 5 years imprisonment or a fine of $20,000 dollars or both.

## Labelling

**Proper labelling would ensure that the manufacturer gives all information necessary to pesticide users to enable safe and effective use of pesticides.**

*Article 10 of the FAO Code sets up the specific labelling provisions as follows:-*

*10.1 All pesticide containers should be clearly labelled in accordance with applicable international guidelines, such as the FAO guidelines on good labelling practice.*

*10.2 Industry should use labels that:*

*10.2.1 include recommendations consistent with those of the recognized research and advisory agencies in the country of sale;*

*10.2.2 include appropriate symbols and pictograms whenever possible, in addition to written instructions, warnings and precautions.*

*10.2.3 in international trade, clearly show appropriate WHO hazard classification of the contents or, if this is appropriate or inconsistent with national regulations, use the relevant classification.*

*10.2.4 include, in the appropriate language or languages, a warning against the reuse of containers, and instructions for the safe disposal or decontamination of empty containers.*

*10.2.5 identify each lot or batch of the product in number or letters that can be read, transcribed and communicated by anyone without the need for codes or other means of deciphering.*

*10.2.6 are marked with the date (month and year) of formulations of the lot or batch and with relevant information on the storage stability of the product.*

**In Malaysia**, labelling requirements for pesticides are found in the Pesticides (Labelling) Regulations 1984 (hereinafter called the Labelling Regulations). Regulation 3 of the Labelling Regulations prohibits the sale of any pesticides which does not comply with the labelling regulations.

Regulation 4 states the various information that must be specified in the label as outlined below.

a) Tradename of the pesticide

b) Its formulation, contents, ingredients

c) Its usage (herbicide, insecticide, fungicide etc)

d) Names and address of registrant

e) Actual date of manufacture

f) Symptoms of poisoning and recommended first aid treatment

g) Class of pesticide through colour band

Regulation 7 of the Labelling Regulations states that there must be warning and caution statements in Bahasa Malaysia and three other locally used languages.

Regulation 15 of the Labelling Regulations states that there must be clear instructions for the mixing and handling of pesticides, and disposal of its containers.

TABLE 34: Workers' awareness about the details on pesticide labels

| Details on labels | Number of sprayers who cited each labelling detail | Percentage of respondents out of the total interviewed |
|---|---|---|
| Symptoms of poisoning | 2 | 4 |
| Recommended first aid treatment | 1 | 2 |
| Instruction for safe use | 2 | 4 |
| Direction for mixing | 1 | 2 |
| Direction for handling | 1 | 2 |
| Direction for disposal of container | nil | nil |
| Warning or caution | 1 | 2 |

Sample number = 50

Table 34 shows that only two percent of the plantation workers interviewed were aware that there are directions for mixing and handling on the labels. The rest of them said they just mix and handle pesticides as they deem fit. Only two percent of the workers interviewed are aware that warning and caution are printed on the pesticide labels. The worker saw the skull and cross-bones sign on the labels and interpreted it as a warning symbol.

*"When I see the skull and bone sign, I know it is dangerous and may cause death."*

*– Rani*

Although the list of labelling requirements in the Labelling Regulations is fairly lengthy, the requirements do not take into consideration the fact that the majority of these pesticide sprayers are either illiterate or may not comprehend what is written on the labels.

Table 35 shows the rate of literacy among the workers surveyed.

TABLE 35: Literacy rate among pesticide sprayers surveyed

| | Percentage of respondents out of the total interview who noted each category below | | |
|---|---|---|---|
| **Language** | **Speak** | **Write** | **Read** |
| English | nil | nil | nil |
| Bahasa Malaysia | 80 | 20 | 20 |
| Tamil | 100 | 50 | 50 |

Sample number = 50

Although Regulation 8 of Labelling Regulations makes it mandatory for pesticide labels to include direction for the safe and effective use of pesticide, if it is in English, none of the workers will be able to read it. Only 20 percent of the workers surveyed understand the directions in Bahasa Malaysia.

*FAO's Guidelines for Regulation and Control of Pesticides outlines the directions for labelling.*

1. *In cases of illiteracy in rural areas, warning symbols should receive due attention.*

2. *Label directions are especially important where cultural differences (for example garments and footwear) may accentuate the risk of the users being exposed. In such circumstances, the label directions may need to be supplemented by special training programmes.*

3. *It is most important that the labels should give sufficient information to ensure safe storage and handling, including recommended precautions to be taken when diluting and spraying the product and disposing of empty containers.*

## Storage

Article 10.3.1 of the FAO Code states that industry should ensure that packaging, storage and disposal of pesticides conform in principle to the FAO Guidelines for Packaging and Storage, The FAO Guidelines for the Disposal of Waste Pesticides and Containers, and WHO Specifications for Pesticides Used in Public Health.

*The FAO Guidelines for the Packaging and Storage of Pesticides states that pesticide containers should be stored as follows:-*

*6.1.1. Construct and maintain areas so that the risk of contamination to other products is avoided.*

*6.1.2 Clearly mark the area with warning signs.*

*6.1.3 Store pesticides in original labelled containers, positioned so that the label is clearly visible.*

*6.1.4 Design the area so that the chemical and physical properties of the product, shelf life, are likely to be maintained.*

*6.1.5 Separate volatile pesticides from other pesticides to avoid cross contamination and always store in an unrestricted atmosphere.*

*6.1.6 Rotate stock to avoid expiration of shelf life if the product is to be stored over seasons and try to maintain stock to a reasonable operating minimum.*

In Malaysia, under Section 57 (1) (g) of the Pesticide Act 1974, the Minister is empowered to make rules to regulate the storage of pesticides. As a result, Pesticides (Licensing for Sale and Storage for Sale) Rules 1988 was enacted.

The Pesticides (Licensing for Sale and Storage for Sale) Rules 1988 merely requires a person wishing to sell pesticides to have a sale licence and a person wishing to store pesticides for sale to have a storage licence.

Table 36 on the next page shows the response received from the plantation workers on how paraquat is stored in their workplace.

The results of the survey as shown in Table 36 indicate that the rules for storage and display of pesticide containers as laid down in the FAO's Guidelines for the Packaging and Storage of Pesticides are not followed.

| TABLE 36: Storage of pesticides in the plantations surveyed | | |
|---|---|---|
| **Methods of storage** | **Number of workers stated how pesticides were stored** | **Percentage of respondents out of total interviewed** |
| Storeroom at the workplace | 32 | 64 |
| Storeroom in the housing quarters | 18 | 36 |
| Storeroom in an isolated area | 0 | 0 |

Sample number = 50

*One-third of the sprayers interviewed reported that pesticide containers were stored in their housing quarters. However, the FAO Guidelines for the Packaging and Storage of Pesticides states that all pesticide storage areas should be kept locked to avoid theft or unauthorized access. Clearly this guideline has not been complied with. The survey results on the other hand indicate no pesticide is kept locked.*

One worker said:

*"I store pesticides just like I store my working clothes in the house. What's wrong? It's easier if the pesticides are kept in my house as I can just carry it straight to the working fields."*

The FAO Guidelines for the Packaging and Storage of Pesticides states that regular inspection of the storage area should be undertaken, giving special attention to damage, spills and deterioration. However, from the interviews, it was gathered that the workers are not aware of such regular inspection. In fact, they claim that in all their working lives, they have never seen such an inspection being carried out.

## Disposal of Pesticide Containers

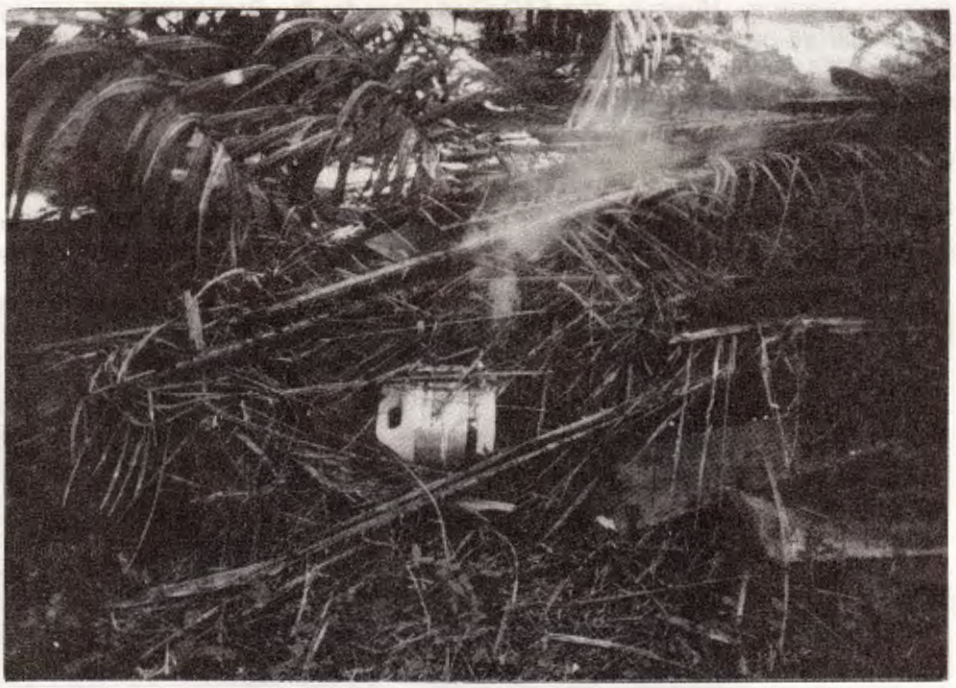
The FAO's Guidelines for the Disposal of Waste Pesticide And Pesticide Containers states that all used pesticide containers should be decontaminated before disposal.

*The three stages for decontamination are listed below:-*

*i) empty the contents of the container into the mixing tank and drain for 30 seconds.*

*ii) rinse the container at least three times with the volume of water not less than 10 percent of the containers total volume.*

*iii) add the rinse each time to the mixing tank.*



Burning of empty container in the open

*The FAO Guideline states that non-combustible large containers should be disposed of in one of the following ways:*

*– return them to the supplier; or*

*– sell them to a firm dealing in used drums or barrels that is equiped to neutralise the toxicity of adhering materials. Contact your pesticide dealer for the names and addresses of such firms; or*

*– take them to a sanitary land field type of dump; inform the operator of the dump that the drums contain residues of poisonous materials; warn him that poisonous vapours may be produced if the containers are burned. Before leaving remove lids of bungs from the containers; chop holes in the containers with a sharpened pickaxe to prevent re-use. Make sure the site cannot contaminate water supply; or*

*– if none of the preceding disposal means are available to you, find a private disposal site of the type described above which you will use only for empty containers and unwanted pesticides. Correct site selection is most important. Before leaving, again ensure lids or bungs are removed from the containers and chop holes in them with a pickaxe to avoid re-use.*

*– do not re-use for any purpose.*

*The FAO Guideline states that non-combustible small containers may be disposed of at a public dump or buried at least half a metre deep at a private disposal site. First remove the caps or lids, punch holes in metal containers, break glass containers. Do not use containers for storage of food, feed or water for domestic consumption.*

In Malaysia, no regulation exist to date to cover disposal of pesticide containers. Many reports throughout the country have shown an extremely dangerous practice that of re-using pesticide containers for storing food or water. Some people were reported to have mistakenly drunk pesticide thinking it contains coffee or Coca-Coda (eg. paraquat which is in black colour is often mistaken for 'Kopi O' [Black coffee]).

Regulation 15 of the Pesticide (Labelling) Regulations only imposes a directory requirement that the label should include a statement on container disposal such as: "DO NOT USE EMPTY CONTAINER TO STORE FOODSTUFF" and "BURY WHEN EMPTY", which is not mandatory.

However, from the interviews it was gathered that none of the pesticide sprayers bury empty containers away from the sites specified as they are all not aware of it. Most of them reported throwing away the pesticides containers in the workplace (plantation) or in their quarters.

A careful examination of the Malaysian Pesticides Act 1974 will give the impression that it is indeed a comprehensive piece of legislation.

However, from the above findings, we found there are several important provisions of the Act which has not been enforced and regulations for safe handling of pesticide have not been enacted, namely:

i) Regulations for safe transportation of pesticide in bulk quantities;

ii) Regulations to ensure measures to be taken by employer to safeguard health of plantation workers who are constantly exposed to pesticides;

iii) Regulations to ensure safe disposal of empty pesticide containers;

iv) Regulations to control advertising of pesticide products in all media;

v) Section 15 of the Pesticides Act which concerns with the control of manufacture of pesticides in the factory to ensure workers safety.

## Advertising

*Article 11 of the FAO Code states the pesticide industry should in advertising ensure that:*

*a. all statements are capable of technical substantion.*

*b. restricted use products are not publicly advertised . . . . . unless prominently indicated as restricted use.*

*c. safety claims (e.g. "safe", "non-toxic" etc) are not made, with or without phrases like "when used as directed".*

*d. no guarantees (e.g. "move profits with . . . . . ") are made unless definite supporting evidence is available.*

*e. no visual representation of potentially dangerous practices appear (e.g. application without sufficient protective clothing).*

*f. all advertisements draw attention to warning phrases and symbols as used on labels.*

In Malaysia, the Pesticides Board has distributed its latest draft of the Pesticides (Advertising) Regulations and Guidelines on the advertisements to manufactures, consumer groups and advertising firms for comments. Although there were such provisions in the Pesticides Act 1974, the controls on advertising of pesticides have yet to be enforced. Under the proposed regulations, publication of pesticides which do not bear claims on efficacy and safety would be exempted from the regulations. In addition, all descriptions, claims, comparisons and references to tests, trials and research contained in advertisements would need to be fully substantiated or approved by the Board.

Among other things, advertisements should:

- not show or imply indiscriminate, unnecessary or excessive use of pesticides;
- not contain any statement or visual presentation which directly or by implication, omission, ambiguity or claim, is likely to mislead the buyer, particularly with regard to safety of the product, its nature, composition and suitability for use;
- not contain statements giving impression of professional advice or recommendation made by a person presented directly or implied to be qualified to do so.
- it is hoped that the Regulations would be approved and enforced soon.

The following pages will show some of the advertisements in journals and periodicals in Malaysia on pesticides. The pages also include Check Lists on Advertising (Article 11 of FAO Code) to illustrate the non-compliance of FAO Code by advertisers.

Children at risk (IPCS)

# CHECK LIST

## ■ On Product Information

☒ the advertisement does not contain any statement or visual presentation which directly or by implication, omission, ambiguity or exaggerated claim is likely to mislead the buyer - in particular concerning a product's nature, composition, suitability for use, efficacy, safety and official approval.

☐ all statements used in the advertisement can be substantiated technically.

☐ research results and scientific information are not misused in advertising and that scientific jargon is not used to give claims a spurious scientific basis.

☐ any guarantee contained in the advertisement - such as claims of higher yields or more profits - can be substantiated by technical evidence.

☐ the advertisement does not contain false or misleading comparisons with other pesticides.

☐ the advertisement refers only to recommendations for use which are approved officially and appear on appropriate product labels.

☒ provides adequate information on correct practices - including appropriate safety precautions, recommended rates and frequency of application, safety to crops and safe pre-harvest intervals.

☒ active ingredient provided.

☒ the advertisement displays appropriate warning phrases and symbols.

## ■ On Safety Aspects

☐ ensure that the advertisement contains no claims about the safety of products to humans or to the environment or to wildlife, including the expressions such as "safe", "non-poisonous", "harmless", "non-toxic", "low toxicity" etc are not permitted, even with a phrase such as "when used as directed".

☐ the advertisement contains no comparisons between the safety of different products.

☐ the illustrations used in advertising do not depict potentially dangerous practices such as mixing and application without appropriate protective clothing, use near food or use by or near children.

☒ the advertisement and product literature prominently displays a statement such as "Always read the label before using the product".

---

**☒ - violation of the FAO Code**

*** the Gramaxone advertisement did not state the active ingredient**


TO SOLVE ALL YOUR WEED PROBLEMS...
ALL YEAR ROUND

ICI Agrochemicals

**ICI Agrochemicals (Malaysia) Sdn Bhd**
9th Floor, Wisma Sime Darby, Jalan Raja Laut
P O Box 10284, 50708 Kuala Lumpur

# CHECK LIST

## ■ On Product Information

☐ the advertisement does not contain any statement or visual presentation which directly or by implication, omission, ambiguity or exaggerated claim is likely to mislead the buyer - in particular concerning a product's nature, composition, suitability for use, efficacy, safety and official approval.

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☒ active ingredient provided.

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---

**☒ - violation of the FAO Code**

*** the Wallop advertisement did not state the active ingredient**

# WALLOP HERBICIDE
# VS
# PARAQUAT
## 33% LONGER LASTING. NOW 25% CHEAPER


### Proven 33% Longer Lasting

In independent tests in oil palm conducted by a major plantation group+ in collaboration with 16 agrochemical companies, Wallop herbicide (glyphosate+ dicamba) was tested against paraquat mixtures. The results?

- Wallop is 51% longer lasting than paraquat+ diuron mixture.
- Wallop is more cost-effective than all paraquat mixtures tested.
- Wallop does not cause parthenocarpy.

In similar tests in rubber by another research organisation*, glyphosate+dicamba (tank mixture of Wallop) was proven 42% longer lasting than paraquat +2,4-D amine.

All of which goes to prove our claim: Wallop needs only 3 spray rounds for every 4 of paraquat mixtures. That's 33% longer lasting weed control than paraquat mixtures.

### Now 25% Cheaper

When you consider the fact that with Wallop you need less spray rounds, you're not only saving time and labour, you're saving money too!

And now we're adding substantial savings! 4-liter packs of Wallop are reduced from $18 to just $15 per liter. And in our new 20-liter economy pack you'll save even more - it's just $13.75 per liter or $275 for 20 liters. This makes the cost as low as $1.10 per 18-liter pump of spray solution. Consider round-saving (labour + chemicals) and the reduced price of Wallop, and you'll save up to 25% over paraquat mixtures.

**Get Wallop from Monsanto. It's 33% longer lasting. Now it's up to 25% cheaper than paraquat mixtures.**

WALLOP®

*Always read and follow label directions.*

Source:
- + Paper "Evaluation of new herbicides for general weed control in young oil palm" presented at the 1989 International Palm Oil Development Conference, Malaysia.
- * Paper presented at Rubber Grower's Conference, Melaka, 21 - 23 August 1989.

Prices indicated are for Peninsular Malaysia only.

**Monsanto**

## CHECK LIST

### ■ On Product Information

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☐ any guarantee contained in the advertisement - such as claims of higher yields or more profits - can be substantiated by technical evidence.

☐ the advertisement does not contain false or misleading comparisons with other pesticides.

☐ the advertisement refers only to recommendations for use which are approved officially and appear on appropriate product labels.

☒ provides adequate information on correct practices - including appropriate safety precautions, recommended rates and frequency of application, safety to crops and safe pre-harvest intervals.

☒ active ingredient provided.

☒ the advertisement displays appropriate warning phrases and symbols.

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☐ the advertisement and product literature prominently displays a statement such as "Always read the label before using the product".

---

**☐ - violation of the FAO Code**

*** the <u>Counter</u> advertisement did not state the active ingredient and its packaging comes in a container that looks attractive and might encourage re-use**

# Introducing COUNTER® Herbicide. For effective general weed and lalang control.


It's here! **COUNTER** from Harrisons & Crosfield.

A new herbicide that packs real power when it comes to weeds and lalang.

That's because **COUNTER** contains **41% glyphosate isopropylamine salt**, the general weed and best lalang herbicide available today.

And, because **COUNTER** is registered and manufactured by Monsanto, maker of Roundup® herbicide, you know it's good.

So try **COUNTER**. For really effective general weed and lalang control.

**COUNTER** is available in 200ml, 500ml, 1 liter, 4 liter and 20 liter packs for your convenience.

**®Registered trademarks of Monsanto Co., USA.**

**Always read and follow label directions.**

## HARRISONS & CROSFIELD (M) SDN. BHD.

No. 9, Jalan 222, 46100 Petaling Jaya, Selangor Darul Ehsan. Tel: 03-756 7266 Telex: MA 37665 Fax: 03-7577994.

Branches

• Alor Setar (04-716188) • Butterworth (04-342555) • Ipoh (05-546751/780) • Teluk Intan (05-621844) • Petaling Jaya (03-7567266) • Seremban (06-725567) • Malacca (06-224282/231425) • Johor Baru (07-567716/7) • Kota Bharu (09-740942/785780) • Kuantan (09-511144)

## A Summary of Pesticides (Highly Toxic Pesticides) Regulations 1988

### 1. General

A new piece of legislation called Pesticides (Highly Toxic Pesticides) Regulations 1988 has been drafted by the Ministry of Agriculture to provide protection for workers dealing with Highly Toxic Pesticides. The draft law appears to be very promising and is a positive step to overcome many of the problems among pesticide workers discussed earlier.

Below is a summary of the draft Regulation which is waiting for the approval of the Minister of Agriculture before it can be gazetted as the law of Malaysia.

Regulation 2 of the Pesticides (Highly Toxic Pesticides) Regulations 1988 (hereinafter referred to as 'the Regulations') define highly toxic pesticides to mean any of the substance listed in the First Schedule which comprises of paraquat and its mixtures, monocrotophos and calcium cyanide or any mixture thereof.

### 2. Duties of the employer with regards to a worker who uses or handles highly toxic pesticides.

Regulation 3 prohibits an employer from employing four categories of persons in the use or handling of highly toxic pesticides. The categories are as listed below:

- person under the age of 16 years.
- person certified as suffering from disease which would be aggravated by exposure to highly toxic pesticides.
- female worker who is pregnant or lactating.
- person not informed of the hazards of handling such chemicals.

Regulation 4 requires an employer to maintain records of:

- workers involved in the use or handling of highly toxic pesticides.
- highly toxic pesticides and total working hours with the pesticide.
- highly toxic pesticides received.

Regulation 5 provides that highly toxic pesticides should be stored in a locked and well ventilated room and only authorised persons can have access to the room.

Regulation 6 prohibits an employer from permitting a worker to use or handle highly toxic pesticides unless the worker is wearing the protective clothing and provided with a first aid kit.

Regulation 7 imposes a duty on the employer to:

# Introducing COUNTER® Herbicide. For effective general weed and lalang control.


It's here! **COUNTER** from Harrisons & Crosfield.

A new herbicide that packs real power when it comes to weeds and lalang.

That's because **COUNTER** contains **41% glyphosate isopropylamine salt**, the general weed and best lalang herbicide available today.

And, because **COUNTER** is registered and manufactured by Monsanto, maker of Roundup® herbicide, you know it's good.

So try **COUNTER**. For really effective general weed and lalang control.

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**Always read and follow label directions.**

## HARRISONS & CROSFIELD
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- highly toxic pesticides and total working hours with the pesticide.
- highly toxic pesticides received.

Regulation 5 provides that highly toxic pesticides should be stored in a locked and well ventilated room and only authorised persons can have access to the room.

Regulation 6 prohibits an employer from permitting a worker to use or handle highly toxic pesticides unless the worker is wearing the protective clothing and provided with a first aid kit.

Regulation 7 imposes a duty on the employer to:

- provide the appropriate protective clothing as specified in the Third Schedule (see page 117).
- maintain it in good condition.
- provide washing facilities to thoroughly wash their protective clothing.

Regulation 8 imposes a duty on employer to provide each working team with a first-aid kit at the work site appropriate for the highly toxic pesticides.

Regulation 9 imposes a duty on the employer to:

- ensure all spray solution of highly toxic pesticides be used on the day of preparation and if there are any remaining solution, it should be kept locked in a secure place.
- ensure the capacity of knapsack sprayer used shall not exceed 14 litres.
- provide adequate and suitable cleaning facilities including soap, supply of piped running water or clean water in containers for workers' personal use.
- prohibit a worker to use or handle highly toxic pesticides for more than 8 hours a day.
- prohibit a worker to use or handle highly toxic pesticides alone.

Regulation 11 imposes a duty on the employer to institute a medical examination for all workers handling highly toxic pesticides by a registered medical practitioner. A copy of the medical examination report should be given to the worker upon examination.

Regulation 12 provides that the employer should:

- remove a worker from work involving further poisoning or exposure (for 3 years) if the medical report shows poisoning or exposure and causes of poisoning to be reported to the Minister and the Pesticides Board.

Regulation 13 imposes a duty on the employer to ensure that all workers who use or handle highly toxic pesticides are trained and given oral and written instructions on relevant safety precautions and first aid.

**3. Duties of the worker with regards to using or handling highly toxic pesticides**

Regulation 10 imposed on the worker, a duty to wear the protective clothings provided by the employer.

Regulation 14 makes it mandatory for persons using highly toxic pesticides to:

- destroy empty containers by burying at sites away from dwellings, wells, water courses, crops and livestocks.
- comply with all labelling instructions.
- ensure it is not used in residential or recreational places, or at any place where there is a likelihood or risk of contaminating water supplies.

Regulation 15 requires a person using highly toxic pesticides to display a notice bearing the words "DANGEROUS" and "NO ENTRY' – POISONED AREA" to be displayed at the site where highly toxic pesticides has been sprayed. The notice should be in Bahasa Malaysia or other suitable language for a duration as specified in Sixth Schedule (see page 118).

## List of Protective Clothing and Equipment required to be worn and carried by the worker handling each pesticides

| Protective clothing & equipment required to be worn | Paraquat concentrates & monocrotophos | Paraquat spray solution | Calcium Cyanide |
|---|---|---|---|
| Normal working clothes | x | x | x |
| Cotton overall/ apron (neoprene, rubber) | x | x | |
| Gloves (nitrite, rubber, PVC, neoprene) | x | | x |
| Boots (neoprene, rubber) | x | x | |
| Head covering | x | x | |
| Face shield (plastic) | x | x | |
| Dust mask | x | x | |
| Respiratory equipment | | | x |

## Duration of Notice to be Displayed

| Highly toxic pesticide used | Duration of notice to be displayed |
|---|---|
| Paraquat and its mixtures | 48 hours including application time |
| Monocrotophos | While application is in progress |
| Calcium Cyanide | 48 hours including application time |

## COMMON LAW

In the nineteenth century, the law of torts (civil wrongs) recognized only specific categories or liability for conduct in which negligence, nuisance, strict liability and some others were figured. Now, it is clear that a more general formulation of the law must be evolved to permit remedies in tort to embrace new areas of social friction and human loss. One such area of growing concern is toxic torts. Toxic torts are injuries caused by toxic substances.

In the developed countries, individuals injured by toxic substances have begun to seek remedies through the legal system. The Malaysian legal system should look into the matter seriously so as to accommodate the victims of toxic injury. When people have been exposed to toxic susbtances like pesticides leading to personal injury, statutory relief is often inadequate. Thus, remedies available under common law should be applied.

Pesticide workers are directly exposed to toxic chemicals daily and they suffer injuries. They should have recourse to legal means to compensate their adverse health effects.

### Negligence

When damage arises from spraying or handling of pesticides, the cause of action that arises would be negligence, i.e. liability of a manufacturer and/or employer for failure to take reasonable steps to warn the workers of its dangerous nature. The victims would then be compensated if the defendant is found liable for negligence.

In the case of Ferebee v. Chevron Chemical Company[1], in the United States, an agricultural worker at a government agricultural research centre brought an action of negligence against a manufacturer of paraquat, alleging that he contracted pulmonary fibrosis as a result of long-term skin exposure to diluted solutions of paraquat. The court held that the manufacturer's knowledge of the link between dermal paraquat exposure and lung disease was sufficient to require a more detailed label than that which was provided. The manufacturer was negligent and liable to pay costs and damages.

### Assault and Battery

Assault and battery seems to be an unusual basis of liability for redressing toxic injuries. Battery is the intentional and direct application of force to another person. Assault is an act which causes the plaintiff, reasonable apprehension by the infliction of a battery on the plantiff by the defendant. Battery cases involving toxic substances are becoming more frequent in the United States. The following American case would be helpful in aiding us to use this theory of liability in the Malaysian context.

In Blankenship v. Cincinnati Milacron Chemical Inc[2]., it was observed than an employer exposing his employee to toxic chemicals was sufficient to take the case into the category of assault. An action in assault will not be possible if the plaintiff was totally ignorant of what he was exposed to and therefore could not feel any apprehension towards the defendant's action.

In Malaysia, pesticide sprayers often complain of the hazardous effects due to their proximity to the chemicals. This long standing anxiety that their health could be affected at any time could be a case of assault.

The lack of awareness and knowledge that workers have a right to take legal action has meant that they (pesticide sprayers) suffer in silence in Malaysia.

As with the U.S., the regulating statutes of the common law on the theories of liability in Malaysia should also be formulated by legislation to address the increasing cases of victims of toxic exposure.

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REFERENCE:

1. 736 Federal Reporter (F.2d) p. 1529 (1984)

2. 690 Ohio Reporter (Ohio 2d) p. 608 (1982)

# INTERNATIONAL LABOUR ORGANIZATION'S (ILO) CONVENTION CONCERNING SAFETY IN THE USE OF CHEMICALS AT WORK

## Introduction

ILO is an inter governmental organization that looks specifically into issues related to labour. In 1990, the International Labour Conference adopted the Safety in the Use of Chemicals at Work Convention (No. 170). A convention is binding on parties who have consented to be bound by it by signature, ratification, accession, acceptance or approval. Conventions are used as a basis for developing regulations at national level. ILO will continue to encourage the ratification of the Chemicals Convention 1990 (No. 170). As with agrochemicals, this will be achieved particularly through the efforts of the ILO's regional advisers on Standards and related technical programmes.[1]

This Convention contains a set of comprehensive guidelines that emphasise the safe use of chemicals at work. It notes that the protection of workers from the harmful effects of chemicals also enhances the protection of the genral public and the environment. Governments should adopt this Convention and use it as a guide in developing healthy and safe working practices with regards to the use of chemicals at work. Currently, in Malaysia, the Ministry of Labour is developing a draft Act on Occupational Health and Safety. It is not clear if the plantation sector would be included in the Act. Since Malaysia is a member of the ILO, this Convention could be a guide for the development of the proposed Act.

## The Convention

The Convention applies to all activities that use chemicals.

The term "use of chemicals at work" is defined as any work activity which may expose a worker to a chemical including:

(i) the production of chemicals

(ii) the handling of chemicals

(iii) the storage of chemicals

(iv) the transport of chemicals

(v) the disposal and treatment of waste chemicals

(vi) the release of chemicals resulting from work activities

(vii) the maintenance, repair and cleaning of equipment and containers for chemicals.

Paragraph 2 to Article 7 states that hazardous chemicals shall be labelled in a way easily understandable to the workers, so as to provide essential information regarding their clarification, the hazards they present and the safety precautions to be observed.

Part Four of the Convention outlines the responsibilities of employers with regards to use of chemicals at workplace. Article 10, states employers shall ensure that all chemicals used at work are labelled. Labelling requirements are covered in by Article 7. Chemical safety data sheets have been provided as requested by Article 8, and should be made available to workers and their representatives.

Article 12 clearly provides duties of employers to ensure that workers are not exposed to chemicals to an extent which exceeds exposure limits or other exposure criteria. The criteria for the evaluation and control of the working environment should be established by the competent authority, in accordance with national or international standards.

Article 12, covers the duty of the employer to monitor and record the exposure of workers to hazardous chemicals when this is necessary to safeguard their safety and health or it may be prescribed by the competent authority.

The records of the monitoring of the working environment and the exposure of workers using hazardous chemicals are required to be kept for a period prescribed by the competent authority. And thus should be accessible to the workers and their representatives.

Article 13 emphasises that employers should make an assessment of the risks arising from the use of chemicals at work and should protect workers against such risks by appropriate means. The Convention concerning safety in the use of chemicals at work considers that it is essential to prevent or reduce the incidence of chemically induced illnesses and injuries at work by:

(a) ensuring that all chemicals are evaluated to determine their hazards

(b) providing employers with a mechanism to obtain from suppliers information about the chemicals used at work so that they can implement effective programmes to protect workers from chemical hazards

(c) providing workers with information about the chemicals at their workplaces and about appropriate preventive measure so that they can effectively participate in protective programmes

(d) establishing principles for such programmes to ensure that chemicals are used safely

(e) the choice of chemicals that eliminate or minimise the risk

(f) the choice of technology that eliminates or minimises the risk

(g) the use of adequate engineering control measures

(h) the adoption of working systems and practices that eliminate or minimise the risk

(i) the adoption of adequate occupational hygiene measures

(j) where recourse to the above measures does not suffice, the provision and proper maintenance of personal protective equipment and clothing at no cost to the worker, and the implementation of measures to ensure their use.

Employers should always provide adequate information and training to their workers. Under Article 15, employers shall inform the workers of the hazards associated with exposure to chemicals used at the workplace. They are further required to instruct the workers on how to obtain and use the information provided on labels and chemicals safety data sheets. The provision also makes it clear for employers to train their workers on a continuing basis in the practices and procedures to be followed for safety in the use of chemicals at work.

Rights of workers and their representatives are outlined in Part 6 of the Convention. Workers have the right to remove themselves from danger resulting from the use of chemicals when they have reasonable justification to believe there is an imminent and serious risk to their safety or health and should inform their supervisor immediately. Workers who remove themselves from danger in accordance with the provisions above and who exercise any other rights under this Convention shall be protected against undue consequences.

It is further stated that the worker concerned and their representatives have the right to:

(a) information on the identity of chemicals at work, the hazardous properties of such chemicals, precautionary measures, education and training.

(b) the information contained in labels and markings.

(c) chemical safety data sheets.

(d) any other information required to be kept by this Convention.

The Convention in full is attached as Appendix 5.

# CHAPTER 5

# The Plantation Sector

**"Workers involved in spraying of pesticides should be paid $20 rather than the present $10 per day because of the high risks involved in the job... hundreds have lost their lives and limbs because of wrong handling of pesticides besides having permanent scars and loss of fingernails..."**

**N. Krishnan**
**Research Officer**
**National Union of Plantation Workers**
**NEW STRAITS TIMES (Malaysia)**
**1 December 1990**

# The Plantation Sector*

## The Colonial Period and the Plantation Workers

Women's position in the plantation sector can be examined through their role in the labour market and the cultural practices of the predominantly Indian community. During the colonial period, rubber became a commodity integrated into the world economic system. The plantation operated in an extremely profitable environment with easy availability of capital and labour. Land was made available by the colonial government on very favourable terms. Rent was only 10 cents per acre for the first 10 years after which the rent was increased to 50 cents per acre. Most plantation companies were formed outside Malaya, mainly in England. The plantations were managed by directors and managers. In the 1930s, four agency houses of directors and managers controlled more than one-third of all plantation acreage in Malaya. Prior to 1930 little concern was shown for the labourers welfare and social needs. The Indian labourers of the estates came under the paternalistic care of the colonialist estate managers.

## Management of Plantations

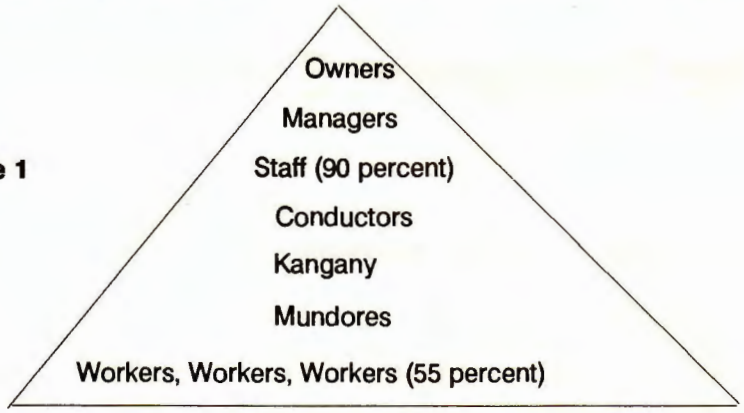
South Indian peasants, particularly the so-called low caste Madrasi were recruited to execute the repetitive manual labour tasks on the estate. The colonialists believed that these people were easily manageable, worked well under supervision and were most acceptable to the lowly paid, regimented life of the plantations. In short they were a cheap, submissive and easily controlled labour force.

Immigrant labour was possible as the British were in control of both India and Malaya. Tamils were recruited through the Kangani system. The Kangani was elected by management as headman in the working community, an intermediary position with relative power and responsibility.

*An edited paper on Women in the Plantation Sector: An Overview by Irene Fernandez. Irene Fernandez is the Director of Tenaganita.

There was a clearly delineated hierarchy in the management of the plantation as illustrated in **Figure 1.**

**Figure 1**




## Women as Labourers and The Development of Family Units

Prior to 1928 the bulk of the labour recruited for work in the estates was male. It was only in 1928 that the sex-ratio rule of the Indian Emigration Act of 1922 was enforced in Malaya. This rule required that for every 3 males recruited and allowed to emigrate, 2 females should be assisted to emigrate.

The key objective for this change was to develop family units so that the male workers would become permanent workers. Therefore the development of family units would ensure a steady and permanent work force that could be more productive. Women then played the dual role of providing cheap labour and social stability.

The family units that evolved were less mobile. They had to pay back all costs of their journey from India. This was deducted from their wages. Thus, they were in constant debt-bondage. The estates provided basic housing. This provision enabled families to maintain a basic level of subsistence.

Flourishing family units strengthened the caste system. Workers of similar caste mixed together. For management, the caste system was an effective method of controlling workers and maintaining the Kangani's social position.

## Women Enter the Labour Force

The colonial master and plantation managers' main concern was profit maximisation in the shortest possible time. In the plantation sector, labour was regarded as the major production cost. The extent of labour savings by technology was minimal. Therefore in order to lower costs and obtain maximum surplus value, the value of labour had to be lowered.

This led to the introduction of women and child labour on the estates. Due to the often isolated position of the estate and the unavailability of other employment, women were exploited as a source of cheap labour. Women were employed as rubber tappers and field workers. Wages

were so low that families could hardly make ends meet. Women were not in a position to reject such an opportunity to increase the family income.

As tappers, they did the same work as men: tapping rubber trees, collecting latex and bringing it to the collection centre. However, women's wages were lower. The field workers were almost all women and children, dependents of the male rubber tappers. They were employed mainly in maintenance of the estate, mostly weeding.

Besides discrimination in wage rate, there was marked division of labour. The majority of male rubber tappers were employed as fulltime workers on the check roll system. They received a fixed daily wage for a whole days work. The majority of women tappers were regarded as casual workers employed under the task system and the result system. Those under the task system were given a certain amount of work and paid by the number of tasks completed at the end of the month. The wages of this group fluctuate depending on the amount of work available in each month. Workers under the result system were also given tasks but were paid according to the weight of dry rubber in the latex obtained from tapping.

The work of women was irregular and not permanent. Their wages were not only low but also inconsistent with their male colleagues. The majority of the women were field workers, whose wages were even lower than the casual tappers. A primary reason for employing women as dependents of male tappers is evident in circular No. 12, 1931, sent by the Plantation Association of Malaya which states:

*"The tappers' wages were not adequate to cover his dependents cost of living. Either the tapper had to be paid enough to support his dependents or the dependents had to be employed. The latter course was cheaper."*

The letter goes on to state:

*"To reduce or do away with the non-tapping labour force would make maintenance of a full tapping force difficult. Every field must be kept in production; a day's wages saved by leaking latex from a tree due to a vacancy in the tapping force was not enough compensation for the revenue lost."*

Sprayers are mostly women

Women who were the non tapping labourers were recognised as a reserve tapping force, albeit without being paid as tappers. Tapping is skilled work and field work is unskilled. Therefore the women's wages were only supplementary and her labour exploited as a mobile reserve force. Geographically, the women together with the men were isolated from the rest of the Malayan economy. Economically, too, she was isolated as she could not find employment outside the estate organisation. Politically, she was controlled by the Kangani. Socially, being a woman and a Hindu, she was also considered inferior to men. This isolation from all aspects not only sharpened the inequality but the women became totally dependent on their husbands for their existence. These factors contributed immensely to the exploitation and subordination of women in the estates.

## Women, the Depression and Unemployment

The status and condition of the women and their families were closely linked to the fluctuating market price of rubber on the international market. During the boom periods, facilities for schooling and maternity allowances for women were given.

However, in times of slump and unemployment the women casual tappers and field workers were the first to be retrenched. The first depression was after the First World War. The wages of the male head of the household were reduced by 25 percent amounting to 40 cents per day. The widows received 30 cents per day. Wage cuts were drastic. By June 1920, wages of male workers had fallen to 28 cents per day and those of female workers to 24 cents per day.

Towards the end of 1926, rubber prices rose sharply. Consequently, wages of workers were raised to 45 cents for men and 36 cents for women. The "good - bad year" cycles did not change the position of women in the plantation system.

The male superiority remained intact and more men turned to alcoholism especially since prices for toddy, tobacco and opium were reduced by management. There was also an increase of incidence of violence against women.

## Synthetic Rubber and Diversification of the Plantation Sector

The Second World War gave the main impetus to the development of synthetic rubber on a large scale. Synthetic rubber consumption rose from 20 percent of the market in 1950 to nearly two-third of total world consumption in 1970. Synthetic rubber seemed more reliable and cheaper to produce due to the low price of crude oil. Most of all it was controlled by the developed countries of America and Europe. Thus natural rubber lost its monopoly in the world market.

In Malaysia rubber is still the largest single crop by acreage. Out of 6.9 million acres under cultivation, 60 percent is rubber. Plantations looked for quicker returns in rubber. High yield new rubber clones were planted. By 1973, 95 percent of the large plantations replanted rubber trees using stimulants. The number of rubber trees to be tapped by a worker was also increased from 350/400 to 600/700 trees per day.

## TABLE 37: Employment in Estates

| Type of Estates | 1967 | | 1975 | | 1980 | | 1981 | | 1982 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Male | Female | Male | Female | Male | Female | Male | Female | Male | Female |
| Rubber | 114,470 | 108,590 | 88,670 | 95,420 | 72,820 | 92,730 | 70,570 | 92,760 | 63,702 | 83,713 |
| Coconut | 2,710 | 1,900 | 1,850 | 1,510 | 1,920 | 1,770 | 1,684 | 1,602 | 2,210 | 2,150 |
| Oil Palm | 16,630 | 9,940 | 42,120 | 21,070 | 51,460 | 24,370 | 49,213 | 22,305 | 55,410 | 36,740 |
| Tea | 2,210 | 2,240 | 1,460 | 1,770 | 1,140 | 1,580 | 1,030 | 1,420 | 836 | 1,091 |
| Pineapple | 2,030 | 1,180 | 660 | 390 | 780 | 820 | 700 | 730 | 683 | 688 |

Source: Ministry of Labour, Labour and Manpower Report, 1981/1982.

## The Estate Workforce, 1967-1982

Labour force figures for this period indicate a decreasing trend in the number of male workers on the rubber estates. In 1967, women formed 47 percent of the total workforce. By 1982, this percentage had increased to 57 percent.(Table 37) The male labour workforce for the same years decreased by 44 percent.

The decline in the demand of rubber in the international market saw the restructuring and retrenchment of many workers as the agricultural sector began to diversify. Many of the displaced male workers were absorbed into the oil palm plantations, especially when the rubber estates were converted to oil palm cultivation. Other crops like cocoa and coconut were also introduced. Consequently, male workers increased from 16,630 to 55,410 during the period under review in the oil palm plantations. Female workers decreased as the demand for female labour in the oil palm sector was lower.

The oil palm plantations required only male harvesters. Women were dependents of the harvesters. They lost their skills as tappers, once again they became unskilled workers, used now for maintenance of trees, soil and in collecting loose fruits from the ground during harvest.

One important area of demand for female work was as pesticide sprayers. Women especially young girls between 16 - 25 were being employed as pesticide sprayers. It was estimated that about 130,000 women were working as pesticides sprayers. Thus the position of women in the plantations has not changed although the kind of work and how they were being employed has changed.

## Wages . . . . . Poverty . . . . . Problems of Women and Children

Wages of workers especially tappers were ad hoc, partly as a result of the fluctuations in the price of rubber on the world market. The highest paid workers were the Mandores who were all male. The lowest paid were the weeders who were mainly women. The average earnings of rubber tappers in 1982 was $267 per month. The Mandores earned an average of $340 while factory workers received $302. By 1979, both male and female workers earned $3.60 per day in basic wages.

However, more than 50 percent of the workers in the plantations were living below the poverty line. The mid-term review of the Fourth Malaysia Plan indicated an increase in poverty in the estate sector. Plantation workers form one of the largest groups in the country living in poverty.

In a situation where traditionally there was a demand for unskilled workers, the survival strategy of the estate workers was to maximise the number of wage earners in the family. The average number of children until very recently, was seven. For women each pregnancy would mean two months leave. This was the only occasion when women might receive maternity benefits. Currently women receive maternity benefits for only the first three pregnancies.

Faced with low wages and low income, it is left to the women to make ends meet and care for the health and welfare of the family. Many households take food on credit from the estate grocery

shops. Those who are slightly better off, buy consumer goods such as radios, televisions, bicycles and motorcycles on hire purchase. Consequently, indebtedness is a perennial problem.

In a situation where indebtedness had reached an advanced stage, it was women who suffered most as they were the ones harrassed by the money lenders and creditors. Possessions, especially gold, were pawned or sold to repay the debts.

The double burden of fulltime work in the estates and in the house has taken a heavy toll on the lives of women in the plantation. A fulltime working woman is up at 4.00 am to collect water and prepare meals for her family. By 6.00 am she is out at work and returns by 3.00 pm at the earliest. She then has her daily chores and household work of cleaning, cooking, gathering fuel, and fetching water. Added to this is the day to day pressures of bringing up children and meeting the husband's sexual demands.

Rubber plantation in Malaysia

Financially the status of women has improved. However the subordination has increased in other ways. A condition of the equal wage deal is that women are expected to perform ladder tapping even when they are pregnant. Miscarriages have been frequent. Although no statistics are available women leaders from the plantation as well as discussions with gynaecologists who deal with plantation women, have suggested that the number of estate women suffering from prolapsed womb was high. Women are viewed by the union and management from an economic perspective, they lack a holistic perspective to the issue of the need to protect womens reproductive role. This is highlighted in the area of childcare. Before the equal pay system was introduced, women were allowed to visit their children at the creche, breastfeed or even take care of some household chores while waiting for the latex to drip. Now this role has been suspended. She is expected to be at the worksite and leave this role to someone else, possibly an elder girl child. Consequently, many young girls are denied a basic education because of the nessescity of caring for her younger siblings. The demands of work and housework have imprisoned women and kept them from participating in social and union activities. Union participation has become almost a non-issue for women. They have also internalised it as a role for men. On the part of men, very little has been done to encourage women to participate in union activities. Leadership is recognised as a role men have within the family and his leadership role is transferred to the community. Added to this, is the fact that women were not exposed to or lack the experience to participate effectively at meetings. Women fear voicing themselves, as culturally, assertiveness is likened to aggressiveness within the patriarchal hierarchy.

Husbands or fathers still collect the wages of their wives or daughters, often they decide how best the family income should be utilised. Equal wages have only increased the family income, this factor has not given women more control or independence within the family or estate. On the contrary, her subordination has become even more entrenched.

## The Growth of Contract Labour System

Since the early 1970's, the plantation industry has attempted to reduce its responsibility to the labour force. Though research has been done on increasing productivity through better use of tools for faster tapping or harvesting, still labour is crucial to the industry. By reducing the industry's responsibility for labour, it could then concentrate more on profit maximising and diversifying its industry.

One effective method that has been introduced is the development of the contract labour system. In this system, management identifies the most important and skilled work required for the plantation. It then looks at jobs that can be done on an ad hoc basis. Tapping and harvesting are the key tasks on the estates, so tappers and harvesters become the permanent workforce, directly controlled by management.

Tasks like weeding, pruning, breaking of cocoa pods, pesticide spraying have been identified as supportive jobs. The plantation industry sub-contracts these tasks. Contractors take over the tasks and role of employing workers for a fixed sum. The workers come under the control and mercy of the contractor. The work is piecemeal, many workers are employed on a temporary basis, relying on the contractor's ability to obtain more contracts.

Poor regulation of contractors can lead to abusive practices. It has been known for contractors to

abscond without paying workers. The contractor is free to choose his workers from within the plantation or from outside. Many contractors recruit migrant workers, particularly Indonesians. Migrant workers sell their labour cheaply and are forced to work under harsh conditions. The local workers on the other hand, have less bargaining power and must concede to the conditions and terms of the contractor.

With the introduction of the contract system, women have become contract workers. Consequently, the impact of contractual labour has led to further exploitation of women and greater job insecurity. Women's dependency on male members of the family also increases.

## Women's Struggle and the Labour Movement: National Union of Plantation Workers (NUPW)

Female participation within trade unions has been steady in terms of proportionate participation at around 27 percent. This has significant implications as there has been a marked increase in the female labour force during the last two decades. In reality there is a widening gap between women in the labour force and the number of women in the trade unions. There have been various reasons given for this.

This issue has been raised by various groups by union leaders, at the International Labour Organisation (ILO) and women's groups. The ILO mission report in 1962 noted that the level of women's participation was disappointingly low especially in the leadership levels. At a NUPW Delegates Conference in 1951, Madam Valliamal from Johore Plantations Workers decried the lack of the unions encouragement to women and demanded that the delegates turn their attention to the issue. Then when 1975 was declared International Women's Year, the Malaysian Trade Union Congress made efforts to revitalise the Women's Section. A second attempt was made during the decade 1975-1985. However, in spite of these outcries and efforts, very little change has taken place on the position and participation of women in the trade union movement.

Women out in the fields

## The Struggle for Equal Wages for Women

In the plantations the issue of wage claims was negotiated between the unions and existing employers associations. Until 1953, when the Coronation Agreement was signed, women estate workers did not receive the same pay as their male counterparts. There was no justifiable reason except that it was more profitable for the employers. Such practices further reinforced the concept that women's income is supplementary. Another justification for paying women lower wages was that although women worked as hard as men they were thought not capable of sustaining the effort over a long period of time.

While it is true that the unions have contributed much in the fight for equal pay for women, it must be remembered that this issue was only taken up at the beginning of the 1950's among the estate workers unions. In 1948, some of the very same unions did not see fit to question the inequality in women's wages but rather accepted the inequality as part of the negotiations. The change came in 1950 when the Plantation Workers Union of Negeri Sembilan negotiated for equal wages for all workers.

In 1963 strikes in the rubber estates accounted for 48 out of the 85 strikes and for 72 of the 103 strikes in 1966. Women were actively involved, for instance, in Batang Berjuntai estate, women were actively organizing themselves to celebrate Women's Day on 3rd March 1948 by holding concerts and requesting a day's holiday for that purpose. In another estate near Kajang, women tappers had met with a Chinese reporter and complained among other things, of their employers evasion in paying maternity benefits. This same issue was raised during a union meeting in Batu Arang Estate when a women was appointed as chairperson.

In 1950, women were reported to have gone on strike over issues of pay and sexual molestation. In the Samagaga estate in Bagan Serai, 140 tappers went on strike over wage alteration from daily to piece rate by the management. Among the strikers were 55 women. In Panavan Karupiah estate, Sitiawan, the central issue of the strike was against sexual harassment, an issue that had been taken up as far back as 1939 by the Klang Indian Association. Recently, in 1987, two women workers from Carey Island lodged police reports regarding sexual harassment.

From the above, it is clear that women were involved in action and strikes over general issues regarding work and on issues very specific to women like the cases of sexual molestation.

*"Our day begins at 5.30am. During roll call we are assigned to a particular section of the estate division. The Kangani would assign the female worker he fancies to a place where he can take advantage of her. If she resists, she is subjected to pressure. She may be given difficult tasks or be bullied continuously. Some of the women succumb to these unwanted sexual advances of their superiors as they are afraid of being sacked for insubordination. As young girls and young wives we are usually the victims. Once it has been found that one of us has been "spoiled" that one will be known on the estate. She will be forced to leave the estate and her family or she will commit suicide. Most of us choose suicide as we have no place to go to".*

*- Kanni*

## Estate Worker

Various other specific issues that directly affect women or are the concern of women were not the main issues. This is maybe because demands concerning maternity, creches and the like were provided for in the labour code.

Today, out of about 60,000 members in the national union, women make up 57 percent. Each member pays $5/ per month union dues. Membership entitles her to a book that contains the by-laws and her rights as an union member. In practice, very few union members, especially women have this book.

The number of women in positions of leadership within NUPW is negligable. There are no women leaders at national or branch level. Only a handful of women leaders are present at the local level. Women's voice within the Union is little more than a whisper.

The weak and non participation of women is an issue to reckon with. However, it is equally important to recognise and understand the reasons why women are not participating.

There are a number of issues that the NUPW has failed to address to date that affect women directly. The hospital assistant or the paramedic who treats the estate worker are usually male. Women who suffer from gynaecological problems have faced unsympathetic paramedics and have been unable to get proper medical attention. Added to this, is the lack of monitoring of the effect of work on the women, e.g. effect of pesticide spraying on her reproductive system; the effect on her womb of carrying oil palm fruits that weigh over 40 kg , and her right to housing as a permanent worker in the estate. Presently housing is allocated to men, as the recognised head of the household. If a husband finishes his job and retires or loses his job, his wife and children have to leave the house, even if his wife is employed on the estate.

Whilst the Union fails to champion the cause of women on the estates and fails to understand the position of women within the plantation sector, many women workers have no faith in the Union.

## Conclusion

The subordination of women in the plantation sector has changed little since the Colonial period. Both management and government have successfully used women's position within the family and their position in society for profits. Management, the government and the union have been responsible for perpetuating and entrenching the gender bias. To bring about change in the participation of women in the Union, the women members themselves need to be made conscious. Opportunities must be created by the Union itself, where women can come together and discuss their life, their work, problems, aspirations and their involvement. One strategy that could be developed is the formation of women's committees at all levels.

Through these committees, women would be able to talk freely, discuss and organise themselves. It would also be a platform for women to develop their leadership skills. There has to be a political will and commitment from the union to ensure increased participation of women in the union. There has to be systematic and continuous training sessions at all levels where women can develop both perspective analysis and organising skills.

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# CHAPTER 6

# Sustainable Pest Control

**"Besides killing off natural enemies, pesticide use tends to set off more outbreaks ... Moreover, the organisms that the pesticides seek to kill could become more tolerant leading to the phenomenon called pesticide resistance..."**

**Law Hieng Ding**
**Science, Technology and**
**Environment Minister**
**NEW STRAITS TIMES (Malaysia)**
**8 May 1991**

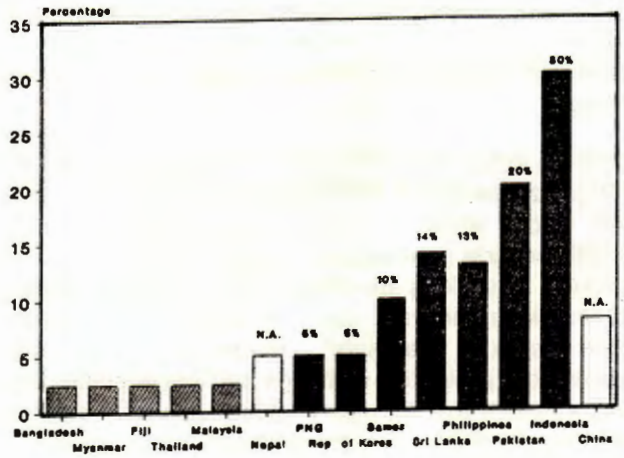
# Sustainable Pest Control*

When modern pesticides were introduced at the end of the Second World War, we were told that "science has found the weapons for total victory on the insect front." These hopes unleashed an all-out chemical warfare. Today our rivers, streams, oceans and soils are laced with chemicals and so are our bodies. Virtually everyone carries traces of at least half a dozen pesticides in their tissues.

But this "chemical warfare" is not over. In fact, global pesticide sales have tripled since 1970 and today over three million tons of pesticides are applied to our ecosystem. In 1972, some US$3,000 million worth of pesticides were sold but in 1985 this had increased to US$15,900 million. According to data from Wood Mckenzie and Co Ltd, analysed by Mowbray, 20 percent (equivalent to 600 000 tonnes annually) of the pesticide manufactured are exported to developing countries. And this market is expected to grow rapidly. The fastest growing market, however, is Africa, with an increase in sales of 182 percent between 1980 and 1984. Other rapidly expanding markets are Central and South America (32 percent increase between 1980 and 1984), Asia (28 percent) and Eastern Mediterranean region (26 percent). The major groups of pesticides were used in 1985 in the following proportions: herbicides, 46 percent; insecticide, 21 percent and fungicides, 18 percent.

Figure 1 shows the growth rates in several countries in Asia and the Pacific during the period 1980-1985.

Fig 1: Estimated increase in pesticide use, 1980 - 1985




Source: ADB 1987

*This paper was written by Sarojeni V. Rengam, Executive Director and Coordinator for PAN Asia and the [illegible] in Penang.

Presently a handful of multinational companies based in Europe and the United States dominate the worldwide trade in expensive and hazardous pesticides. In fact, ten companies dominate about 75 percent of the world market of agrochemicals.

This increase in pesticide use has been a source of concern for a number of reasons. First, some of the more toxic compounds are being used as a result of the withdrawal of older organochlorines from the market. Farmers are untrained in application techniques and lack protective equipment. Second, absence of effective regulatory programmes has resulted in poor labelling and quality control of products, inadequate training of pesticide applicators and health practitioners, ineffective enforcement and lack of monitoring of exposure, adverse effects on the environment and residues on food products. Third, pesticide companies have been marketing their products aggressively and sometimes unethically. Fourth, pesticide exporting countries have been dumping pesticides in the South that are banned, severely restricted, withdrawn or unregistered (because of their adverse effect on human health and the environment).

Today, according to a recent report published in the World Health Organization (WHO) journal, annually about 25 million people are poisoned by pesticides in the South alone. Furthermore, WHO states that "there is no segment of the general population that is sheltered from exposure to pesticides and potentially serious health effects, although a disproportionate burden is shouldered by the developing world and high-risk groups in each country."

Exposure to pesticides can occur during manufacture and formulation, transportation, storage, mixing, application and disposal. Applicators suffer the majority of the poisonings (though in some rapidly industralizing countries, workers in manufacturing plants - where technology is often outdated and inadequately maintained - are also exposed). The general public in developing countries are affected through contamination of water, food and air containing pesticide residues, by pesticides drifting from aerial spraying in agriculture; from pesticides used in houses to control disease vectors; from washing, bathing or drinking water from contaminated rivers and irrigation ditches and worse still, farmers applying pesticides are often not trained in their use, protective clothing recommended for use may be unavailable or impractical in tropical climates. Measures to restrict the re-entry into a sprayed field for certain number of hours or days are difficult to enforce.

In addition, a recent Pesticide Action Network report reveals pesticide companies still flouting the Food and Agricultural Organization (FAO) International Code of Conduct on the Distribution and Use of Pesticides (FAO Code) which provides basic principles on ethical marketing. The Pesticide Companies still provide inadequate, inappropriate or misleading information on pesticides used in the South. Pesticides are often sold in unsuitable small plastic containers with inadequate labels and warnings for their use. In Indonesia, Thailand and the Philippines, advertisments claim that pesticides are "safe". Models derobing promote herbicides, pretty women spray pesticides without protective clothings and sweepstakes encourage the misuse of pesticides. Hazardous pesticides like Arsenic Trioxide are easily available over the counter in Thailand, Aldicarb is repackaged without any safety precaution in Indonesia, and in India retailers rarely recommend protective clothings.

Containers of pesticides should never be reused but when the pesticide industry offers their products in plastic jugs with screw top lids and carrying handles they are a temptation to be

reused. Moreover, pesticides banned, or severely restricted or unregistered in the country of manufacture are exported to countries in the South where they are haphazardly used. **Temik**, brand name for Aldicarb, severely restricted in the U.S. was sold unlabelled in small transparent polythene bags to farmers without any warnings and instructions for use. **Torbidan-10**, not registered for use in the U.S. was exported to Sudan and misused by poachers to poison a water hole. Torbidan-10 is a deadly cocktail of toxaphene, DDT and methyl parathion.

**Environmental Hazards**

In terms of environmental impacts, pesticides often harm non-target and beneficial species and soil microorganisms can also be reduced by pesticide residues. Pesticides have been shown to retard the development of plant roots and seedlings, certain fungicides reduce levels of fungi that are natural insect pathogens.

Impacts on wildlife are well documented. Birds and mammals may be exposed at the site of application or disposal and pesticides residues may lead to the depletion of the extraordinary biodiversity in various developing countries.

Pesticide residues are increasingly contaminating groundwater, surface and coastal waters in many regions of the world, creating both constraints to aquatic food production and serious human health risks. Pesticide residues also end up in the food that we eat. Worse still, the majority of pesticides have not been adequately tested for their long-term effects on human health.

**Pest Resistance and Resurgence**

Not only are pesticides poisoning people and the environment but they are an ineffective pest control. Insects have short reproductive cycles which enable them to adapt to the toxification of the environment better than we, and other animals can. The insects that withstand a pesticide dousing pass their survival traits on to their offspring, and soon a resistant population emerges. And the rate at which resistance has developed in recent years has increased dramatically. From 1970 to 1980, the number of arthropod species exhibiting resistance almost doubled, while the number of species resisting some chemical groups increased as much as 17 times.

However, resistance isn't the only way in which insects now triumph over pesticides. Many pests have also managed to exploit new biological niches, which opened up after pesticides had reduced the populations of their natural predators. As a result, pesticides have created pests out of insects that have never been a problem before. While it is impossible to calculate the precise economic cost of pest resistance, Cornell University entomologist and researcher, David Pimentel estimates that fighting resistance costs as much as $1.4 billion a year in the United States alone (over a third of the cost of purchasing and applying pesticides which totals to $4 billion annually).

This insects adaptability may gradually and without fanfare be bringing us to the end of the pesticide era. Since the earlier days of synthetic pesticides, one chemical after another had lost effectiveness, and farmers today are running out of pesticides options. In the end, it may not only be fears about chemical residues in our food or contamination of our water that end the massive use of chemicals in agriculture, but the fact that, over time, pesticides simply stop working.

## A NEW PERSPECTIVE IN PEST CONTROL

"There's no silver bullet in this situation (to control pests) said Dr. Pimentel, "that's where we made the mistake in 1945 and 1950 - we took pesticides to be the silver bullet. Humans seem to do that - we want to find THE SOLUTION. But the only answer is the ecological approach which is highly complex and to achieve that," he says, "we've got a long way to go." But as environmental contamination grows, health hazards mount and pest control practices falter, the need for a more holistic approach to food production has become apparent. The 1987 Brundtland Report of the World Commission on Environment and Development, recognized this need. In the concluding chapter on food security, the report emphasizes, "(We now) require agricultural systems that focus as much attention on people as they do on technology, as much on resources as on production, as much on the long term as on the short term. Only such systems can meet the challenge of the future.

The challenge to agriculturists today is to develop alternative approaches to pest control which eliminates the hazards to humans and the environment, while limiting problems of infestation and resistance among potential pests. Simultaneously, for many of the world's farmers, the search for alternatives is not just a simple response to dangers or restrictions; but is a need born of their lack of economic means to purchase chemical pesticides.

Sustainable pest control is a positive response to the limits and problems of both traditional and modern pest control. It seeks to combine the best aspects of traditional wisdom, with current scientific advance, to create integrated nature-based, agro-ecosystems that are designed to be self-reliant, resource-conserving and productive in both the short and long terms.

There are 4 reasons why sustainable pest control is superior to chemical approaches to pest control.

- **Firstly, sustainable pest control is less costly and can maximize profits**

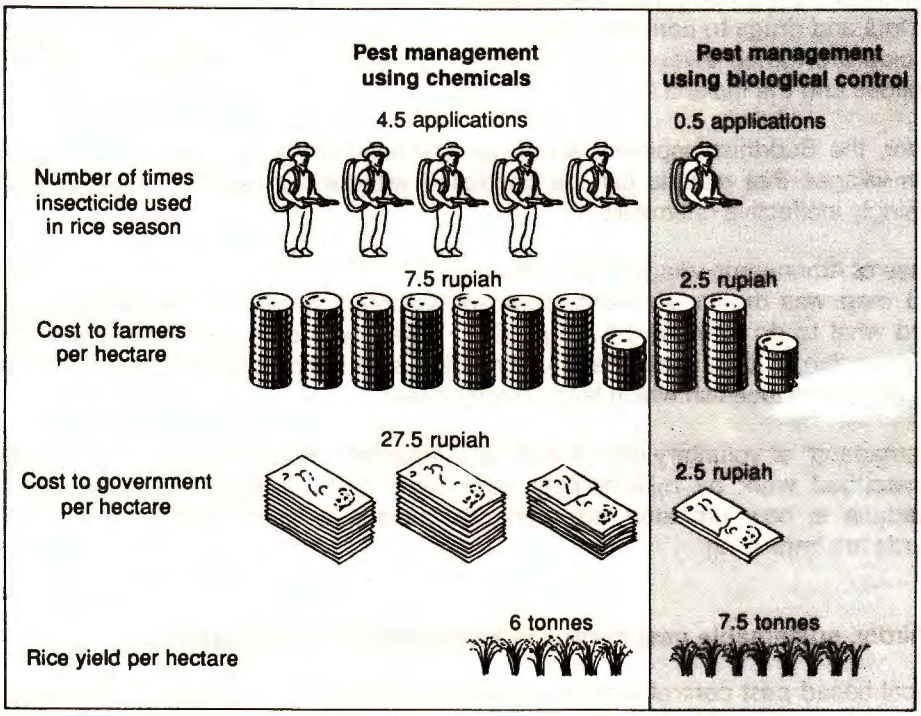
The development of modern agriculture that has given rise to high yields has been achieved by creating large-scale, monoculture, and increased mechanization and use of chemical inputs. Recent studies show that costs of fertilizers and pesticides may be rising faster than yields. This suggest that farmers using such modern agricultural techniques are now facing a cost-price squeeze. For example, a village study in a prime rice-growing area of the Philippines showed farmers' costs (i.e. the money spent on fertilizers, pesticides and fuel) rose between 1970 and 1978, their return measured as a share of the value of their crop fell from one-third to only one-tenth.

With a sustainable pest control programme, the resources available in the region are optimized. Instead of trying to eradicate pests from the environment it seeks to keep the pest populations in check at harmless levels. And the profits received from these programmes are comparable and sometimes even more than profits from conventional farming.

To reinforce this point, a recent study in Cameron Highlands, Malaysia, by the Malaysian Agricultural Research and Development Institute (MARDI) revealed that the profits earned by cabbage farmers sticking to calendar spraying were almost 50 percent less than the profits from

similar plots which had not been treated at all. This was due not only to the extra cost of the chemicals used - which can reach as much as 30 percent of the total production cost - but also to the rejection of pesticide-contaminated crops, resulting in the needless wastage of 10 to 15 percent of Malaysian-grown vegetables.

Another recent example is Indonesia. After the ban of the 57 brands of insecticides for use on rice fields, more ecologically sound crop management techniques were adopted. FAO adviser on the system, Peter Kenmore, maintained that the marginal benefit/cost ratio for pesticide use has more than doubled through integrated pest management methods. Instead of the preventive dousing of rice fields with pesticides, farmers must now assess if pesticide use is warranted and, if so, how small a quantity will do. Crucial to the system is a knowledge of the natural predators already alive in the fields which themselves will kill off harmful insects. Pilot studies in four key rice-growing areas showed that integrated pest management techniques reduced the number of pesticide applications from 4.5 to 1.5 for the 1986 season. Padi yields went up 1 percent and profits up 7.5 percent. Today, within three years after the implementation of the programme, farmers are using 90 percent less pesticides, with large savings in cost for both them and the government. And yields of rice were increasing.




***The advantages of integrated pest management to Indonesia. Farmers switched from chemicals to encouraging natural predators of the pest destroying their rice crops***

**The above diagram by Peter Gardiner was extracted from New Scientist, 9 March 1991.**

- **Secondly, sustainable pest control is better for small-scale traditional producers.**

Sustainable pest control builds on the farmers' traditional knowledge of their crops ecosystems. Today it is becoming apparent that farmers are often a valuable resource in terms of understanding how a particular crop ecosystem works.

Traditional farming practices, which are the result of a long selection process, should form the basis of an alternative pest control programme.

Take the case of traditional farmers in Asia who have avoided the use of expensive fumigants, and saved money by mixing their stored grains with powdered leaves and seeds of the indigenous neem tree to control a variety of pests with a high degree of success. The grains' germination is unaffected even after seven months and there is no residual taste or smell after it has been washed and cooked.

In the area of public health, mosquitoes have been successfully controlled without the use of pesticides in Sri Lanka.

Sri Lanka suffers from both DDT and malathion-resistant mosquitoes. Moreover, since malathion smells foul and drugs to control malaria are widely available, teams that visit villages to spray the insecticide are turned away from half the homes they visit. As a result, the prevalence of the mosquitoes and the malaria they carry is rising.

However, the Buddhist-inspired Sarvodaya (self-help) group has proved through a number of trials in villages that malaria can be controlled without the need for expensive, offensive and increasingly ineffective chemicals.

The case of Athungama village is a good example of how the Sarvodaya group has achieved this. First, a map was drawn, showing all mosquito breeding sites. Then village groups met and decided what to do about every single site. It was decided to either fill, drain, cover with cow dung, pour thin oil over the surface of breeding sites which drowns the air-breathing mosquito larvae, or to introduce fish which feed on the larvae.

A "shramadana" or voluntary day of work was arranged. Four hundred people attended, finished the prescribed work by mid-morning, and went on to build a road and dig a well. The shramadana is now repeated every month, malaria is again rare in the village, and living standards are improving.

- **Thirdly, sustainable pest control is scientifically more advanced.**

Chemical-based pest control is short-sighted and simplistic. It ignores the ecology of pests and their natural enemies and only asks which chemicals effectively kill a given pest.

Unlike conventional pest control approaches, sustainable pest control is thought-intensive. It relies on a sound scientific understanding of the ecology of a given crop ecosystem, including the host (crop, animal herd, or human community), the pests, their natural enemies (predators, parasites, diseases), competitors, alternative hosts, etc. The ecosystem is manipulated so as to

maximize natural pest control methods and minimize the need for outside inputs, like synthetic pesticides.

The experience in Peru in the 1950s is particularly illustrative of an effective holistic approach. There, cotton cultivation was threatened by declining yields as a result of the reduced efficacy of the synthetic chemicals. Instead of attempting a different range of chemicals, the enlightened authorities banned the use of synthetic organic pesticides, reintroduced beneficial insects, and "mandated the adoption of certain cultural practices, such as early maturing varieties, establishing deadlines for planting, and destroying crop residues." As a result of this programme, primary pest outbreaks declined dramatically in intensity and cotton yields rose 30 per cent over previous levels.

- **Fourthly, only sustainable pest control can assure environmental and human safety.**

Proper sustainable pest control reduces the use of harmful chemical pesticides by relying more on other forms of pest control and by using pesticides only when absolutely necessary.

According to the Office of Technology Assessment of the United States Congress, pesticide use in U.S. agriculture could be reduced by as much as 75 percent if sustainable pest control was universally adopted. Even if exposure didn't fall proportionately, reductions would be substantial especially since the exposure of workers and pesticide applicators is related to the number of times they handle the chemical.

## A HOLISTIC APPROACH

The above are few examples of sustainable alternatives that exist and are viable. There are many more.

These pest control strategies have to include an understanding of the ecological factors which allow a species to reach pest status, and places reliance on non-chemical methods of control including:-

- resistant and tolerant crops
- natural enemies
- biological controls
- trap crops
- vegetation and residue management
- mixed cropping
- mixed species pasture and mixed stocking
- pasture management techniques
- crop rotation

- improved soil health
- companion planting
- selection of crops and animals appropriate to the environmental conditions of the region, and the microclimate in a given area.
- various cultural methods.

Furthermore, sustainable pest control methods will only truly succeed if methods of food and fibre production are not only economically viable, and ecologically sound but also socially just and humane. In other words, the new development in agriculture should meet the basic needs of the entire population, achieve a better distribution of wealth and be intrinsically sustainable in environmental terms. For this to happen agriculture should be appropriate to the socio-economic, cultural and environmental circumstances of the given communities. The rights and livelihoods of farmers, especially small farmers and rural communities should be protected. Diversification of agricultural production, the development of new varieties from native genetic stock is also essential. So too, would be the effective protection of genetic diversity of natural resources. Research into and assessment and evaluation of indigenous traditional techniques and empirical local knowledge should be part of this new plan. And finally, there should be a reduction in the environmental impact of any technologies and methods of production utilized.

The road to sustainability will not be an easy one. If we are to proceed on this road, we have to involve all actors: governments, research institutions, businesses and citizens groups.

**What Can Governments Do?**

Governments need to:-

- support principles of sustainable agriculture by shifting support from chemical intensive agriculture to ecologically sound systems.
- make sure that sustainable agriculture/pest control research becomes a priority in government efforts and establish a competitive programme to encourage decentralized research into sustainable agriculture.
- end the impact, production, use and export of particularly toxic agrochemicals, such as those that are persistent, bioaccumulative, carcinogenic, immuno-suppresive, found in groundwater and/or acutely toxic.
- support the withdrawal of subsidies from environmentally unsound agriculture technologies including an end to international and national financing for continued pesticide use.
- encourage and enforce by legislation the minimal or non-use of chemical pesticides.
- enforce right-to-know laws where entire communities are aware of what pesticides are sprayed or in the case of production facilities what are being produced.
- safeguard factory and farmworkers from exposure through regulations requiring protective clothings, medical monitoring and through educational campaigns.

- protect biological diversity in order not to lose valuable biological resources.
- recognize the importance of including environmental and public interest groups in the overseeing of agricultural policy.

**What Can Research Institutions Do?**

Research and Extension institutions should:-

- assess current research efforts to see if they are agriculturally sustainable and establish a plan with target dates specifying the need for all proposed research to meet the sustainability criteria.
- Increase participation in the decision-making process to eliminate private control of the selection of research projects.
- proactively work to influence policy and policy decisions towards a more sustainable agriculture system.
- significantly expand funding for sustainable agriculture.
- assure that all education, training and technical assistance programmes promote practices that are appropriate for the given culture and environment.

**What can the Pesticide Industry and Businesses Do?**

The Pesticide Industry needs to:-

- follow the principles in the FAO Code and implement the principles of Prior Informed Consent (PIC) in their business practices.
- make available health and safety information about the pesticides (technical and formulated including inert ingredients) they produce.
- implement a precautionary-action approach to eliminate environmental pollution and damage from chemical inputs (pesticides, chemical fertilizers and vertinarary drugs) and end public health burden these chemicals place on farmers, farmworkers, consumers and the community at large.

  The essence of the precautionary-action is that, if doubt exists regarding the impact on the environment and human health, the responsible approach is to err on the side of safety rather than risk significant irreversible damage. Action must be taken as a precaution where it is acknowledged that a substance could cause harm without conclusive scientific proof that it does cause harm.

- dedicate a significant portion of research budget into sustainable agriculture and safe pesticide alternatives.

**What Can Citizens Groups Do?**

Citizens groups can:

- monitor the implementation of the FAO Code and ensure national governments are participating in the PIC system.
- join the Dirty Dozen ("DD") Campaign and eliminate the "DD" pesticides from use in the country.
- pressure government for "right-to-know" and "right-to-act" legislation.
- monitor the health and environmental impact of pesticides in the country.
- encourage and/or set up "model" farms employing sustainable agriculture techniques.
- network with other citizens groups for support, solidarity and action.
- help to protect the rights of farmers, farmworkers and rural communities, in conjunction with provision of access to both legal and medical support.
- educate consumers to buy organically grown produce and create a demand for a more sustainable method of agriculture.

Each of us have a role to play to ensure that in the long-term sustainable agriculture/pest control is widely adopted and implemented. We need to take up this challenge.

As Anwar Fazal, former President and Director of IOCU, Regional Office for Asia and the Pacific, succintly described, 'If we want to achieve sustainable development, we must move away from all kinds of violent, manipulating and wasteful technologies - of the kind that much of the technology of the pesticide production, marketing and use represents. It's not easy, but it can be done and more importantly, it must be done."

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References for this article are available on request from PAN Asia and the Pacific, PO Box 1170, 10850 Penang, Malaysia, Tel: 60-4 870271, Fax: 60-4 877445.

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Exposes the export of highly toxic pesticides that have been banned in the U.S. and other industrialized countries to the Third World. Available from: Robert Richter Productions, 330 W 42nd Street, New York, NY 10036, USA.

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Filmed in Thailand and the Philippines, it takes a close look at alternatives to pesticides, why they are necessary and why they are not being developed as fast as they should be. Available from: Television p73 Trust for the Environment, 46 Charlotte Street, London WIP ILX, UK.

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Provides an overview of the problem of indiscriminate use of pesticides, documents the "circle of poison" where exports of banned and restricted pesticides to the Third World return to the industrialized countries in their food imports and includes information about the "Dirty Dozen" Campaign. It also gives ideas and solutions on how these problems can be effectively overcome. Available from: IFPAAW, 17 rue Necker, CH-102 Geneva, Switzerland.

## Posters

33. Circle of Poison: What Goes Around Comes Around. Poster. By Doug Minkler, original, seven-colour, hand silk-screened (51 cm x 66 cm).

Available from: PAN North America Regional Center, 965 Misssion Street, Suite #514, San Francisco, CA 94103, USA. Price: US$18.00.

34. Demise of the Dirty Dozen, Poster, 1989.

Chart listing banning and severe restrictions of "Dirty Dozen" pesticides in 60 countries. Includes resource list and action ideas. Available from: PAN North America Regional Center, 965 Mission Street, Suite #514, San Francisco, CA 94103, USA. Price: US$3.00

35. Pesticides Don't Know When to Stop Killing: Fight the Dirty Dozen Worldwide, Poster, Colour, 56cm by 43 cm, Public Media Center, San Francisco, 1985.

Poster included in the "Dirty Dozen" information pack. Lists the 12 pesticides involved. Available from: IOCU, PO Box 1045, 10830 Penang, Malaysia and PAN North America Regional Center, 965 Mission Street, Suite #514, San Francisco, CA 94103, USA.

# List of Appendices

**"In Malaysia, more than $300 million was spent on pesticides in 1989 and the annual rate of increase over the past five years had grown to about 6 percent..."**

**Mohd. Shariff Hj. Omar**
**Parliamentary Secretary**
**Agriculture Ministry**
**NEW STRAITS TIMES (Malaysia)**
**14 August 1991**

Appendix 1:

# The Serdang Declaration

We citizens and representatives of people's organizations from Malaysia, Indonesia and Thailand met* to address the issues surrounding pesticide use and abuse, in particular the impact of pesticides on women. We have looked at available alternatives to pesticides and worked out action strategies with clear objectives and recommendations.

## The Realities

We have been confronted with cases of women suffering from pesticide poisoning including skin damage, nasal bleeding, cracking of fingernails and problems with the reproductive organs. Over 30,000 women sprayers in Malaysia are daily exposed to pesticides and have very little recourse to treatment, cure or even basic first aid. Due to the absence of medical monitoring and the sad state of the health care system in the plantations, the extent of the impact of pesticides on women, their reproductive health and the effect on the foetus is unknown. Being women and thus subordinate in the family and community, they continue to suffer silently. Unfortunately, the trade union movement has not effectively taken up their cause, and women workers continue to work in harsh and hazardous conditions.

It is common for women sprayers to use pesticides without the necessary precautions. Many do not use protective clothings when mixing and applying pesticides. The high temperatures and humidity in Malaysia make protective clothings inappropriate and very uncomfortable. The storage and disposal of pesticides is also haphazard. Worse still, the pesticide industry promotes pesticides giving very little information on their dangers.

Similarly, in the farming sector, information on pesticides is merely promotional and persuasive rather than for informed choice. And women farmers share similar problems with their sisters in the plantation sector. Their role as farmers is only recently given some recognition but even so they rarely make decisions on pesticide use in their farms.

At present, there is no comprehensive piece of legislation to protect agricultural workers from unsafe and hazardous working conditions. There are studies to show that the International Code of Conduct on the Distribution and Use of Pesticides (FAO Code) regulations enacted to implement the Pesticides Act, 1974 of Malaysia have been violated.

## Vital Information

We also recognize that farmers, sprayers, consumers and citizens groups lack information and awareness on the hazards of pesticides and their impact on users especially women, and the environment mainly because:-

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* Declaration launched at the "Women and Pesticides" Workshop held in Serdang, Malaysia, 3-8, June, 1991.

- there is a lack of reliable information. Independant and continuous research and monitoring of the health of users and of the dangers of using pesticides is lacking.
- the key source of information is from the pesticide industry. When the health and safety data is generated solely by the industry that has a vested interest in the outcome, then misrepresentation becomes possible. In the past, there have been a number of documented cases where such information has been manipulated.
- information available on health and safety of pesticides and research on hazards is classified confidential. The confidentiality of this information has only helped the pesticide industry, not the users nor the people who are exposed to pesticides directly and indirectly through residues in the food, water and the environment.

As consumers, we are concerned about the total lack of information about the levels of residues in our food although we have a laboratory monitoring the situation. In fact, Malaysian consumers came to know there was a problem with pesticide residues only when a neighbouring country rejected our vegetables because of high pesticide residues.

We are also concerned about the use of highly toxic pesticides in the country especially when our farmers and sprayers are not properly trained in their use. Pesticides banned or severely restricted in many countries are still available here. Our country is also involved in producing and exporting pesticides and we are concerned about the health and environmental problems that are caused by their production and use.

## Alternatives Do Work

We are aware that there are viable alternatives to pesticides. There are many successful case studies that reveal pesticides are not necessary in the amounts that are being used today. Our reliance on pesticides as the sole method of pest control has led to problems with pest resistance to pesticides and resurgence. These twin problems have caused untold economic hardship to farmers. Farming methods dependent on high capital inputs including pesticides and fertilizers can also accelerate soil erosion and fertility loss, threatening the base of all agricultural productivity and human sustenance.

As the economic, environmental and social costs of pesticides mount, we believe that we need to change the prevailing methods of food and fibre production if we are to adequately address the problems posed by pesticides. Successful large scale application of an integrated pest management system has been implemented in Indonesia. Biological control including conservation of natural predators, has also demonstrated successful possibilities. We are aware of the growing evidence that sustainable, agro-ecological farming systems offer genuine solutions to the many problems associated with chemical pesticide dependence without sacrificing the yields and efficiencies the world requires.

## Networking For Change

Concerned with the problems posed by pesticides, citizens groups have begun linking together both nationally and globally to tackle the problems. One such network of citizens groups is the Pesticide Action Network (PAN). PAN's "Dirty Dozen" campaign targetted against 12 highly hazardous and widely used pesticides led to stricter controls on those 12 in some countries. PAN has worked to ensure better implementation of the FAO Code which provides guidelines on the distribution and use of pesticides including provisions on labelling, advertising, testing and management of pesticides. PAN also provided the information that led to the adoption of the principle of "prior informed consent". This principle will help importing nations make informed decisions about hazardous pesticides coming into their country.

We also realise that as long as development and agriculture remains profit-centered with increasing monopoly and control by a few, exploitation of our resources will continue. We need to change that. Our philosophy of development must be people and environment-centered and we must recognise that we are only custodians of this planet for future generations.

## Action Agenda

With this concern, vision and philosophy, we make the following recommendations for action:-

1. Recognizing that political will and effective control mechanisms are needed, we recommend:
    - the immediate implementation of the Pesticides (Highly Toxic Pesticides) Regulations, 1988.

- the review of the Pesticides Act so that it is in line with the FAO Code.
- that the Pesticide Board be moved to the Prime Minister's Department for effective coordination and enforcement.
- the ban on the use of all highly hazardous pesticides requiring heavy protective clothings since the use of protective clothings is impractical for the hot, humid climate of this country.
- paraquat be banned since this pesticide is implicated in a large number of pesticide poisonings and most of the deaths due to pesticides.

2. Recognizing that workers in the plantations should be protected from the hazards associated with pesticides and other health problems we call for the enactment of an Occupational Health and Safety Act to cover the plantation industry

3. Aware that there is a lack of concerted monitoring of the health of those who use and work with pesticides we call upon the Ministry of Health and Institutions of higher learning to:

   - conduct research and systematically monitor the short and long term impact of pesticides use on the health of workers and citizens.
   - to make public all research findings so that workers, farmers and consumers will be able to understand the hazards of pesticides.

4. Knowing of the sad state of the health services in the plantation sector we urge the Ministry of Health to ensure better health care facilities and basic amenities be provided to workers in the plantation sector.

5. Concerned that consumers are exposed to pesticides through residues in the food, water and the environment, we call on the Pesticides Board to regularly monitor pesticide residues and to make that information available to citizens.

6. Acknowledging the important role of trade unions in protecting the health and safety of workers, we urge trade unions to:

   - make the pesticide issue into a major labour issue.
   - have continuous monitoring and education programmes for all sprayers on the dangers posed by pesticides.

7. Aware that women workers and women farmers are being daily poisoned we urge that:

   - all women's groups put the pesticide issue on their agenda for action.
   - all citizens groups begin action and education on pesticides and its impact on health and the environment.

8. Recognising that safer, viable alternatives to pesticides exist we recommend that research into such alternatives be given priority and resources be made available for their implementation. We urge the Minister of Agriculture to implement a serious Integrated Pest Management (IPM) policy that would minimise the use of pesticides.

## The Challenge

Minimising and curbing pesticides use and creating the climate for the implementation of agro-ecological systems of food and fibre production on a wide scale will, no doubt, present a great challenge. It is a challenge we, as individuals and groups have accepted with our own agenda for action. We are committed to realising the goals for a sustainable and people-centered development through our action to curb pesticide misuse and overuse. We commit ourselves to working closely with workers in the plantations, farmers including those involved in the FELDA and FELCRA schemes, and with consumers.

Our action for change will be developed through a comprehensive and holistic strategy of research and information gathering, education and consciousness raising, organizing and mobilizing, advocating legal reforms and through legal action, and promoting the development of alternatives including sustainable agriculture.

In order to realise our goals and vision at the national and global levels, we hope to consolidate and strengthen our actions through a pesticide action network in the country. We urge other groups and concerned individuals to join us.

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Appendix 2:

# Women And Pesticides: A Survey

## QUESTIONNAIRE

### A. Questions about the women

1. Name : _____

   Age : _____

2. Name of estate : _____

   Size : _____

   Owner : _____

   Crop : _____

3. How long have you been working here? _____ years / months _____

   What kind of worker are you? _____ contractors / permanent employee

4. Do you have a family? _____ Y / N

   Pregnant Y / N Breastfeeding Y / N

5. What kind of work does your husband do? _____

6. Which language do you speak? _____ Tamil / Malay

   Read _____ Tamil / Malay

7. Do you have an additional income? _____ Y / N

8. How long do you work here each day? _____ hours

9. For how many days in the week? _____ days

10. Do you have time to do other things you enjoy doing? _____ Y / N

## B. Questions about the working methods

1. What kind of work do you do? _____
2. Do you work with pesticides? _____ Y / N
3. Which pesticides are used? _____
4. Who decides which pesticides are used? _____ employer / workers /_____
5. Who decides about the frequency/amount? _____ employer / workers / _____
6. Who provides you with the equipment, protective clothing etc.?

   employer / yourself _____

   What do you have and what do you use? _____

| protective clothing | have | use |
|---|---|---|
| coveralls | | |
| gloves | | |
| eye and face protection | | |
| aprons and coats | | |
| protective boots | | |
| respiratory protective equipment | | |

7. In what condition is the equipment, how old? Eg. is the equipment leaking?

   _____

8. How is the equipment stored? _____
9. Is protective clothing cleaned/washed after use? _____ Y / N

   Together with household laundry _____ Y / N
10. Are you aware of the hazards of the pesticide you use?

    Explain _____

    Do you use protective working methods? _____ Y / N

Did you have any training? _____ Y / N

Explain? _____ Y / N

11. Do you shower and do you change after each spraying? _____ Y / N

Do you wash your hands and face before you eat, drink or smoke? _____ Y / N

Are you aware of the importance of this? _____ Y / N

12. How long before harvest do you stop spraying? _____

13. Are you aware of the residues in food and their hazards? _____ Y / N

14. Do you reuse pesticide containers? _____ Y / N

15. Are you aware of the hazards of pesticides to the environment and your own health?

Y / N

If yes, explain _____

16. How are pesticides stored? _____

How are they packed? _____

17. Are the pesticides labelled? _____ Y / N

Do you read them? _____ Y / N

Are you allowed to read the labels? _____ Y / N

## C. Medical questions

1. Do you know what the symptoms of pesticide poisoings are? _____ Y / N

2. Have you ever had pesticides on your skin? _____ Y / N

Have you ever inhaled or swallowed pesticides? _____ Y / N

3. What medical care is available for you at the estate? _____

_____ _____ Is it free? _____ Y / N

4. How far is the nearest hospital? _____ Do you have transport? _____ Y / N

5. What treatment was given when you were poisoned? _____ Y / N

6. Were you provided with any medications? (drugs) _____ Y / N

7. What were the drugs given? _____

## D. Questions about the estate

1. What is your position at the estate? _____

2. Are there any estate regulations? _____

   Do you have the power to protest against unsafe working conditions? _____ Y / N

3. If you are poisoned or hurt, or had an accident, are you layed off from work? _____ Y / N

   Were you covered by SOCSO _____ Y / N

4. Is there a workers union? _____ Y / N

   Are you (allowed) to be a member? _____ Y / N

5. Is the union responsive to pesticide related problems? _____ Y / N

   Are you aware of the hazards of the pesticides you use? _____ Y / N

6. Are the workers protected from aerial spraying? _____ Y / N

   Explain how _____ Y / N

7. Are your living quarters and your water supplies exposed to contamination? _____ Y / N

8. Do you get the same wages as men or other women? _____ Y / N

   Explain _____

Appendix 3:

# Administrative, Legislation and Technical Aspects Regarding the Regulation of Chemicals in Malaysia*

by S.H. Tan[1] and Halimah Hassan[2]

## I. Introduction

1. Chemicals are widely used throughout Malaysia and as in most countries of the world, they have become an integral part of everyday life. Whilst chemicals have contributed significantly towards the progress of the country, there has also been a growing concern that these chemicals if inadequately controlled or improperly used, may pose a threat to human health and the environment. All sectors of the community, government, industry and the consumer organizations now recognize the importance of understanding the potential hazards related to the use of some of these hazardous chemicals.

2. This paper highlights the administrative, legislative and technical aspects of chemical control in Malaysia.

## II.Environment Authorities, Pesticides Authorities and Other Regulatory Authorities

3. Currently there are a number of legislations in Malaysia that control in one way or another the importation, manufacture, use and transport of various types of chemicals. Altogether seven ministries are involved in administering one or more of these legislations through their respective departments.

4. Pesticides are controlled mainly under the Pesticides Act, 1974 except for certain minor aspects which are still controlled under other ordinances. The Pesticides Board which was formed under the Act is responsible for the implementation of the Act.

5. The main aspect of the Pesticides Act is the control of the manufacture and import of pesticides through registration. The registration process in Malaysia is similar to that practised by many other countries and involved in the evaluation and approval before a pesticide may be allowed to be imported or manufactured in the country. The Pesticides (Licensing for Sale and Storage for Sale) Rules, 1988 require premises selling or storing for sale pesticides to be licensed.

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1 Secretary, Pesticides Board, Malaysia

2 Environmental Control Officer, Department of Environment, Malaysia

6. The Department of Environment has the mandate to prevent, abate, control pollution and to enhance the quality of the environment. This is achieved by administring the Environmental Quality Act, 1974 its amendments and various regulations made thereunder. The intention of the Act is primarily aimed towards prevention or controlling the discharge of waste into the environment in such volume, composition or manner so as not to cause adverse alteration to the environment as well as adversely affecting human health.

7. The Poisons Act, 1952 (revised 1989), is a set of legislations used by the Ministry of Health, to regulate the importation, possession, manufacture, storage, transport, packaging and labelling, sale and use of poisons. Poisons are substances specified by name in the Poisons List Order, 1983.

8. The Food Regulations, 1985 made under the Food Act, 1983 specify requirements such as maximum levels of additives, preservatives, colouring, flavourings and other contaminants permitted in food and labelling of the main ingredients of food imported, prepared or sold. It is also enforced by the Ministry of Health. The Control of Drugs and Cosmetics Regulations, 1984 enacted under the Sale or Drug Ordinance, 1952 (revised 1989), on the other hand regulate through registration, the manufacture, sale and importation of drugs and cosmetics.

9. The Factories and Machinery Department of the Ministry of Human Resources, besides ensuring that machinery used by the industries is safe, also controls potentially toxic chemicals used in the manufacturing processes. The Factories and Machinery Act, 1967 stipulates the requirements for the protection of workers from direct exposure to dangerous machinery, explosives and inflammable, poisonous or corrosive materials that can cause bodily injury or adverse impact to health. Specific regulations made under the Act to control the handling of hazardous materials in a work place include the Factories and Machinery (Safety, Health and Welfare) Regulations 1970, the Factories and Machinery (Asbestos Process) Regulations, 1986 and the Factories and Machinery (Lead) Regulations, 1984.

10. The Port Authorities of Malaysia control and govern the receipt of hazardous materials at marine ports. All Malaysian ports now use the International Maritime Organization Dangerous Goods Codes and Guidelines for Hazardous Materials. Specific legislation governing the handling of hazardous materials has been implemented in some ports (e.g. Klang Port Authority Bylaws (Amendment) 1985-Part 5, Dangerous Goods and Hazardous Cargo).

11. Transportion of dangerous goods by air in Malaysia is regulated by the Civil Aviation Act, 1969 (Amendment 1975). In addition, Malaysian airports subscribe to and use the International Civil Aviation Organization (ICAO) regulations and guidelines covering the transportation of hazardous goods in aircraft.

12. The Road Transport Department, Ministry of Transport administers legislation covering transportation using highways and roads of Malaysia. Although there are no specific regulations presently governing the transportation of hazardous materials on roads or highways there is however, a set of Rules known as the Motor Vehicles (Construction and Use) (Vehicles Carrying Petroleum Products) Rules, 1965 which governs the transportation of petroleum products. These Rules which specify requirement on the construction of vehicles carrying different classes of petroleum on the road have been enforced since 1965.

## III. Role of chemicals in the country

13. The chemical industry is one with great potential for development in Malaysia, considering its resources in petroleum and natural gas. However, Malaysia is still a net importer of chemicals. The chemical industry which has developed in Malaysia supplies the basic needs of other sectors of the economy.

14. Chemicals manufacturing in Malaysia is based primarily on the conversion of raw materials to end-users products.

15. Producers of chemicals in Malaysia may be classified into five basic categories:

i. producers of organic compounds, polymers, resins, paints, vegetable oils, calcium carbide, etc.;

ii. producers of inorganic fillers, fertilizers, etc.;

iii. producers of industrial gases, acetylene, nitrogen, oxygen, hydrogen etc.;

iv. producers and formulators of pesticides;

v. producers of explosives

16. Industries classified as users of chemicals generally produce products to meet the demand for finished goods, either for domestic or for export markets. Sectors which are major users of chemicals include :

- manufacturers of household products;
- manufacturers of electronics and semi-conductors;
- metal finishing industries;
- manufacturers of rubber-based products;
- manufacturers of lead/acid batteries;
- manufacturers of electrical appliances;
- manufacturers of flexible foams;
- manufacturers of plastic products.

17. With regard to pesticides, the bulk of pesticidal active ingredients used in the country are imported as technical materials for formulation purposes. Only a few active ingredients such as paraquat, diuron and MSMA are manufactured locally. However, as the country becomes more industrialized, more active ingredients are expected to be manufactured locally in the future. A small quantity of pesticides manufactured or formulated locally are also exported. The end-user value of pesticides used in 1990 is estimated to be 315 million ringgit (1 US dollar = 2.7

Malaysian ringgit). Table 1 shows the breakdown of the different groups of pesticides sold in the country from 1986 to 1990. This table does not include the household pesticides market which was valued at 130 million ringgit in 1990.

18. Statistics on export of chemicals are compiled by the External Trade and Balance of Payments Division of the Statistics Department based on the Customs Declaration submitted by the Royal Customs and Excise Department. Based on the Harmonized Commodity Description and Coding Systems of Classification, to date about 2,000 codes have been identified for chemicals and products. However, since the coding is mainly for the purposes of tariff, information on import and export of specific chemicals is not easily available from the database.

## IV. National Legislation/Regulations on Chemicals/Pesticide

19. A list of existing Laws, Rules and Regulations on chemicals and pesticides currently enforced in Malaysia is as shown in Annex 1.

20. Whilst there are legislations that control the import, manufacture, and the use of pesticides and pharmaceuticals there is no comprehensive piece of legislation that controls the importation, management, handling and use of other chemicals particularly industrial chemicals. There is therefore a need to develop a comprehensive national legislation to control the import and handling of this group of chemicals.

21. In the development of an Act in the country, views of all interested parties are sought and considered before it is presented to parliament for debate. In the case of rules and regulations formulated under the provisions of an Act. The Minister responsible for the Act has the powers to bring into force such rules and regulations after taking into consideration the views of all concerned.

## V. Non-Governmental Organization / Private Sector

22. There is a very active consumer and environmental protection movement in the country. In addition to local consumer and environmental protection groups, international groups such as IOCU and PAN have also set up regional offices in the country. These groups have played an important role in creating awareness among the people of some of the hazards and problems related to chemicals and pesticides.

23. The pesticides industry is represented by MACA (Malaysian Agriculture Chemicals Association) which has a membership of 41 companies dealing with pesticides. It is estimated that members of MACA handle about 10 percent of the pesticides trade in the country. The other associations dealing with chemicals are the Chemical Industries Council of Malaysia and the Malaysian Oleochemical Manufacturers' Group.

## VI. The Amended London Guidelines

24. The Department of Environment was designated the National Authority for the

implementation of the London Guidelines in 1987. In line with this, an inter-agency Committee on Banned and Severely Restricted Chemicals was established to provide guidance and policy directions on the implementation of the London Guidelines in Malaysia. The Committee comprises of representatives from the Pesticides Board, Factories and Machinery Department, Royal Customs and Excise Department, Pharmaceutical Division and the Health Division of the Ministry of Health with the Department of Environment as the Secretariat.

25. A Technical Committee for Chemicals Not Otherwise Controlled, was also established and will be responsible to provide technical advice and guidance regarding the use and export of banned and severely restricted chemicals, other than pesticides that will be subjected to PIC under the London Guidelines. The Technical Committee comprises of officials from the relevant government departments, industries, non-governmental organizations and academic institutions.

26. With regard to the implementation of the London Guidelines, a National Workshop was convened on 6-8 February 1991, with technical input from the United Nations Environment Programme (UNEP). One of the objectives of the workshop was to create awareness and understanding of PIC and the London Guidelines among relevant agencies, both governmental and non-governnmental; and to identify gaps and shortcoming in the existing legal and institutional structure for the implementation of the London Guidelines.

27. Following the Workshop, technical exports from the Swedish Environmental Protection Agency were engaged to assist the government of Malaysia in the implementation of the Amended London Guidelines.

## VII. International Code of Conduct on the Use and Distribution of Pesticides

28. Concerning the International Code of Conduct on the Use and Distribution of Pesticides, Malaysia is among the countries that adopted Resolution 6/89 on the amendment of Articles 2 and 9 of the code at The Twenty-fifth session of the FAO Conference in 1989. The Pesticides Board of Malaysia has been nominated as the Designated National Authority (DNA) to handle pesticides.

29. The Technical Committee to the Pesticides Board comprising of technical experts from the Ministry of Health, research institutes and the Department of Agriculture functions as the working group for the DNA for pesticides. When the PIC procedures becomes operational, the pesticides industry as well as NGOs will be invited to present their views for consideration by the Pesticides Board.

30. Some of the activities related to the Code of Conduct carried out in the country since the Manila workshop of June 1989 are as follows:

- A set of regulations for the control of advertisements of pesticides has been drafted and sent to all concerned for comments;

- The Pesticides Board has been studying the types of pictograms to be incorporated on labels;

- The Pesticides Board in collaboration with the Standards and Industrial Research Institute of Malaysia, the packaging industry, pesticides industry and other research organizations are reviewing and revising the Malaysian Standards on packaging of pesticides;

- The Pesticides Board with the co-operation of the pesticides industry and research institutions are continuing to develop harmonized regional efficacy protocols.

## VIII. List of pesticides banned or severely restricted

31. The following is a list of pesticides which have not been approved or are severely restricted by the Pesticides Board because of health or environmental reasons:

| Pesticides | Remarks |
|---|---|
| Aldicarb | too toxic for use under local conditions |
| Methomyl | too toxic for use under local conditions |
| Methyl-parathion | too toxic for use under local conditions |
| Dicrotophos | too toxic for use under local conditions |
| EPN | too toxic for use under local conditions |
| Fonofos | too toxic for use under local conditions |
| Scillirocide | too toxic for use under local conditions |
| Endrin | too toxic for use under local conditions |
| Dialifos | too toxic for use under local conditions |
| Ethoprophos | too toxic for use under local conditions |
| 2,4,5-T | health and environmental reasons |
| Heptachlor | health and environmental reasons |
| Monocrotophos | highly toxic, restricted to use by trunk injection for coconut and oil palm only |
| DDT | restricted to use for control of vectors in the public health sector |
| Chlordane | restricted to use for control of termites |
| Dieldrin | restricted to use for control of termites |
| Aldrin | restricted to use for control of termites |

## IX. Summary of country's specific needs

33. One of the most important aspects of the PIC procedure is the exchange of information and it is hoped that countries participating in the procedure receive from FAO and UNEP regular updates on developments on PIC.

34. A good database is also essential for effective implementation of the PIC. In this regard, it is hoped that the database presently developed for PCs by UNEP/IRPTC be made available to participating countries. In addition to the software, a hardware dedicated for use by the DNAs in establishing the database and in processing information on PIC would be necessary. The

NRPTC should also be further strengthened in order to assist decision making in accordance with the PIC procedure.

35. Technical training would be essential for officers of the DNAs and also other relevant agencies involved in the PIC process including customs officers and the officers from the port authorities.

36. The development of a comprehensive legislation for the effective control of chemicals is important. In this area technical assistance should also be provided.

## X. Main expectations of the Workshop

37. It is hoped that the workshop would provide participating countries with a better understanding of the requirements and steps that need to be taken for the implementation of the PIC procedure.

38. The workshop is also expected to provide an opportunity for DNAs within the Asian and Pacific region to meet and share experiences and identify problem and shortcomings and discuss possible solutions for the implementation of PIC.

Table 1

**Malaysia: Estimates of Agrochemical Dollar Value**

| | (million ringgit - End-users' level) | | | | |
|---|---|---|---|---|---|
| | **1986** | **1987** | **1988** | **1989** | **1990** |
| Herbicides | 171.8 | 210.0 | 203.0 | 240.8 | 250.0 |
| Insecticides | 38.0 | 42.0 | 43.6 | 36.0 | 41.0 |
| Fungicides | 15.0 | 16.0 | 16.5 | 12.0 | 14.0 |
| Rodenticides | 8.0 | 9.0 | 9.5 | 9.0 | 10.0 |
| Total | 232.8 | 277.0 | 299.5 | 297.0 | 315.0 |

Source: Malaysian Agricultural Chemicals Association (1991)

**Annex 1**

| Malaysia: List of Legislation Currently in Existence for Controlling Chemicals | |
|---|---|
| **Enforcing Agent** | **Legislation** |
| 1. Pesticides Board<br>Ministry of Agriculture | 1. Pesticides Act, 1974<br>1.1 Pesticides (Registration) Rules) 1976<br>1.2 Pesticides (Importation for Educational or Research Purposes) Rules 1981<br>1.3 Pesticides (Licensing for Sale and Storage forSale) Rules, 1988<br>1.4 Pesticides (Labelling) Regulations, 1984 |
| 2. Ministry of Health | 1. Food Act 1983<br>1.1 Food Regulations 1985<br>2. Sale of Drugs Act, 1952 (Revised 1989)<br>2.1 Control of Drugs and Cosmetics Regulations, 1984<br>3. Poisons Act, 1952 (Revised 1989)<br>3.1 Poisons List Order 1983<br>3.2 Poisons (Sodium Arsenite) (Amendment) Act 1969<br>3.3 Poisons (Sodium Hydroxide) Regulation 1962<br>3.4 Poisons (Psychotropic Substances) Regulations 1989<br>4. Medicines (Advertisement and Sale) Act 1956 (Amendment Act 1990)<br>5. Dangerous Drug Act, 1952 (Amendment 1983)<br>6. Dangerous Drugs (Special Preventive Measures) Act, 1985<br>7. Hydrogen Cyanide Fumigation Act, 1953 (Revised 1981) |

| Enforcing Agent | Legislation |
|---|---|
| 3. Ministry of Trade and Industry | 1. Trade Description Act, 1972<br>1.1 Trade Description (Amendment Act 1982)<br><br>2. Industrial Coordination Act, 1975 |
| 4. Factories and Machinery Department<br>Ministry of Human Resources | 1. Factories and Machinery Act, 1967<br><br>1.1 Factories and Machinery (Asbestos Process) Regulations, 1986<br>1.2 Factories and Machinery (Lead) Regulations, 1984<br>1.3 Factories and Machinery (Mineral Dust) Regulations, 1989<br><br>2. Petroleum (Safety Mesures) Act, 1984<br>2.1 Petroleum (Safety Measures) (Transportation by Pipeline) Regulations, 1985 |
| 5. Customs and Excise Department<br>Ministry of Finance | 1. Customs Act, 1967<br>1.1 Customs (Prohibition of Export) Order 1988<br>1.2 Customs (Prohibition of Import) Order 1988 |

| Enforcing Agent | Legislation |
|---|---|
| 6. Department of Environment, Ministry of Science, Technology and the Environment | 1. Environmental Quality Act, 1974<br>1.1 Environmental Quality Act (Amendment) 1985<br>1.2 Environmental Quality (Clean Air) Regulation 1978<br>1.3 Environmental Quality (Sewage and Industrial Effluent) Regulations 1979<br>1.4 Environmental Quality (Scheduled Waste) Regulations 1989<br>1.5 Environmental Quality (Prescribed Premises) (Scheduled Waste Treatment & Disposal Facilities) Regulations 1989<br>1.6 Environmental Quality (Prescribed Premises) (Scheduled Wastes Treatment and Disposal Facilities Order), 1989 |
| 7. Road Transport Department, Ministry of Transport | 1. Road Transport Act, 1987<br>1.1 Motor Vehicles (Construction and Use) (Vehicles Carrying Petroleum Products) Rules, 1965 |
| 8. Department of Civil Aviation, Ministry of Transport | 1. Civil Aviation Act, 1969<br>1.1 Civil Aviation (Amendment) Act, 1975<br>1.2 Air Navigation Order 1953, Article 37 |

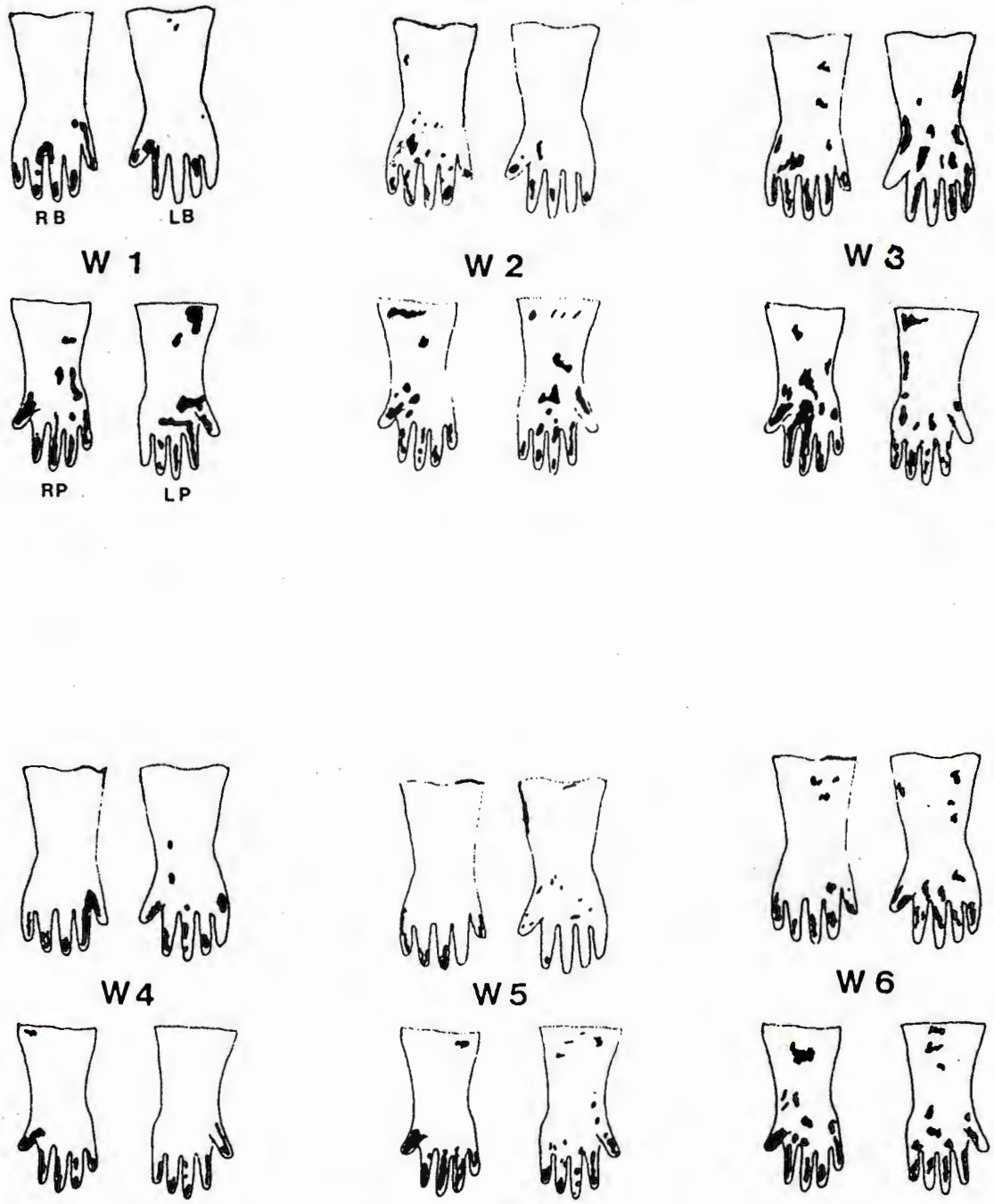
Appendix 4

# Studies on Contamination Patterns, Penetration of Pesticides through Clothing and Spray Operator Protection *

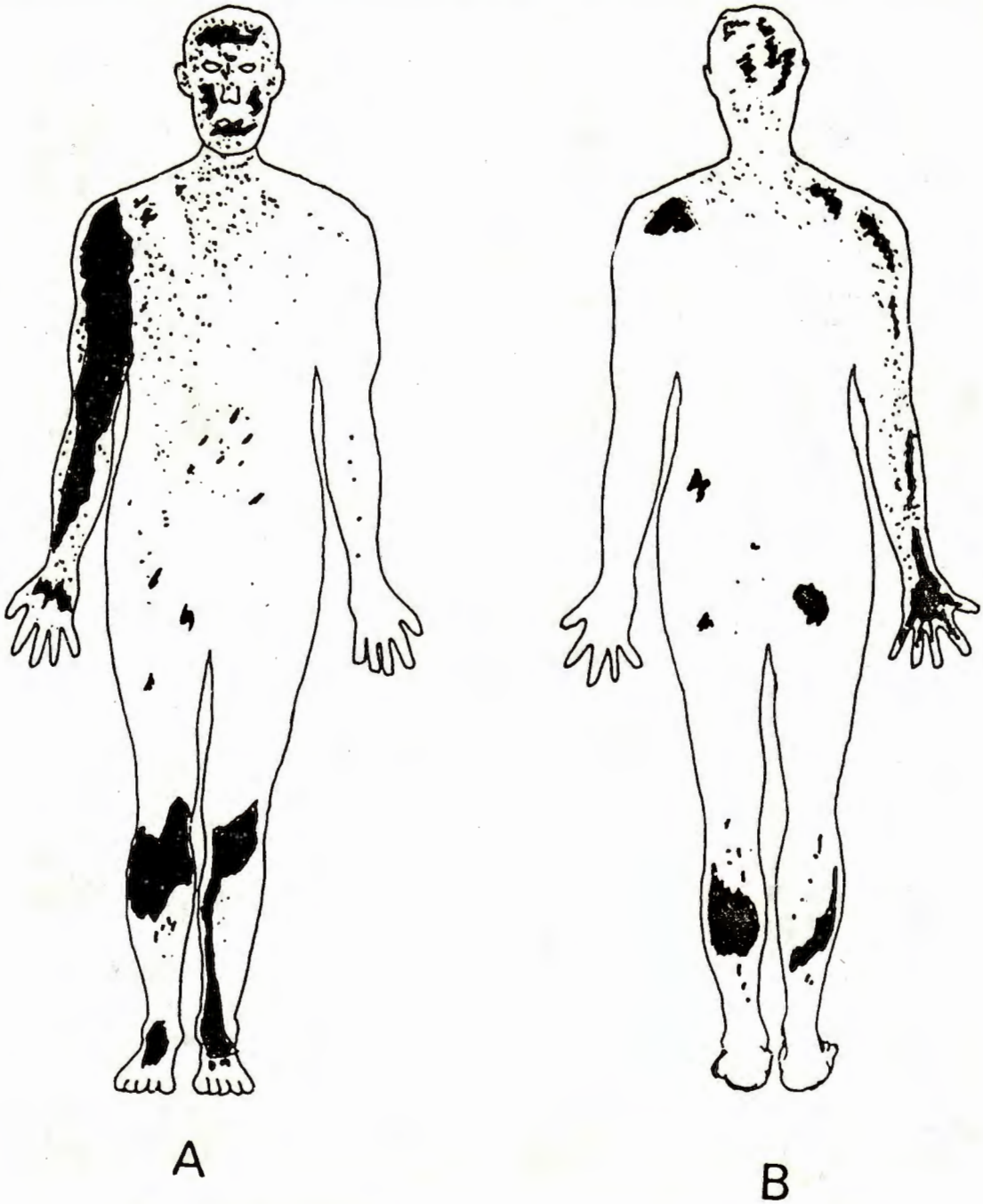
by

Lee S.A. of Malaysian Agricultural Research and Development Institute (MARDI) and
Yang S.C of Bukit Talang Estate, Selangor, Malaysia

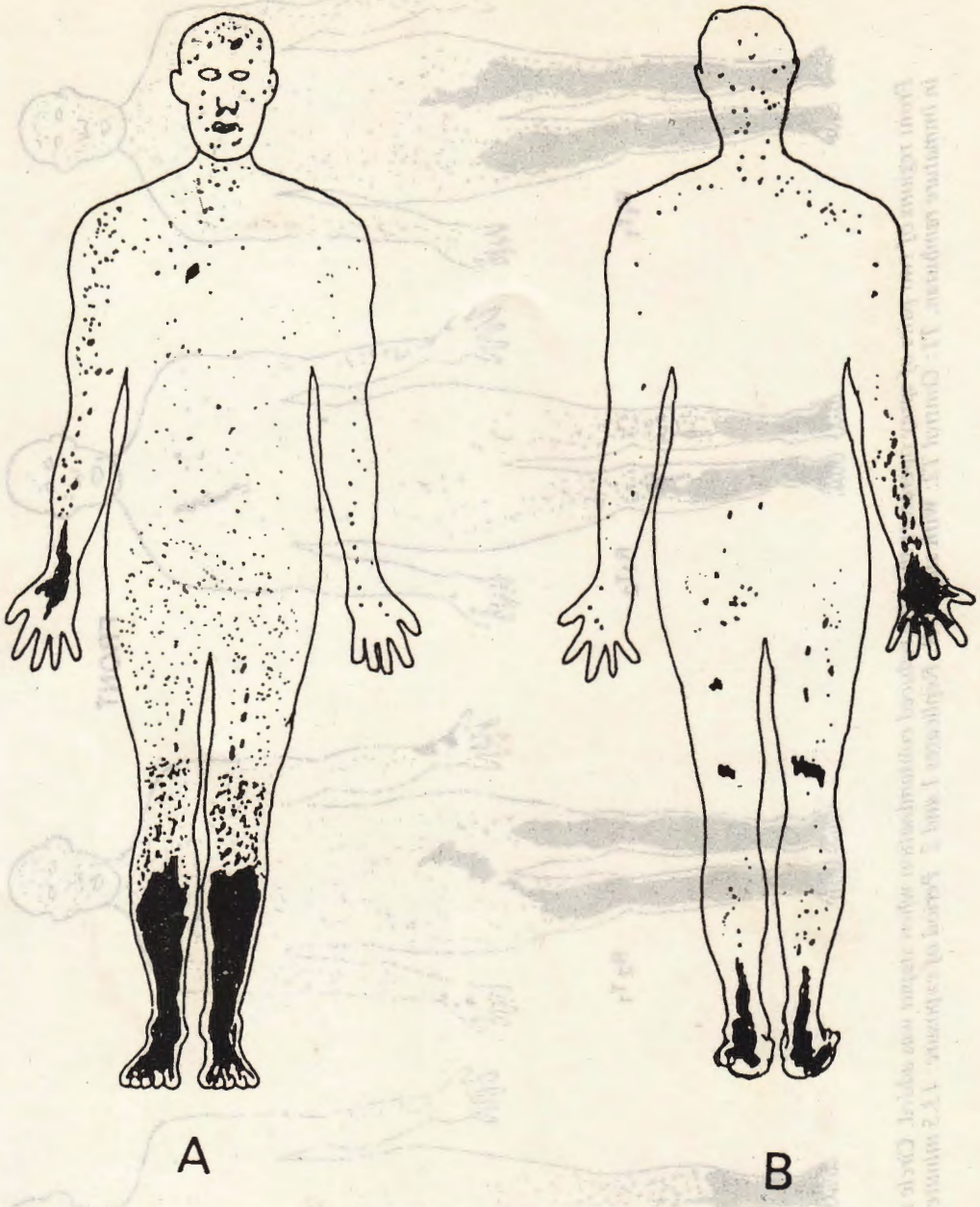
* Taken from **The Planter**, Vol. 67, No. 778, January 1991



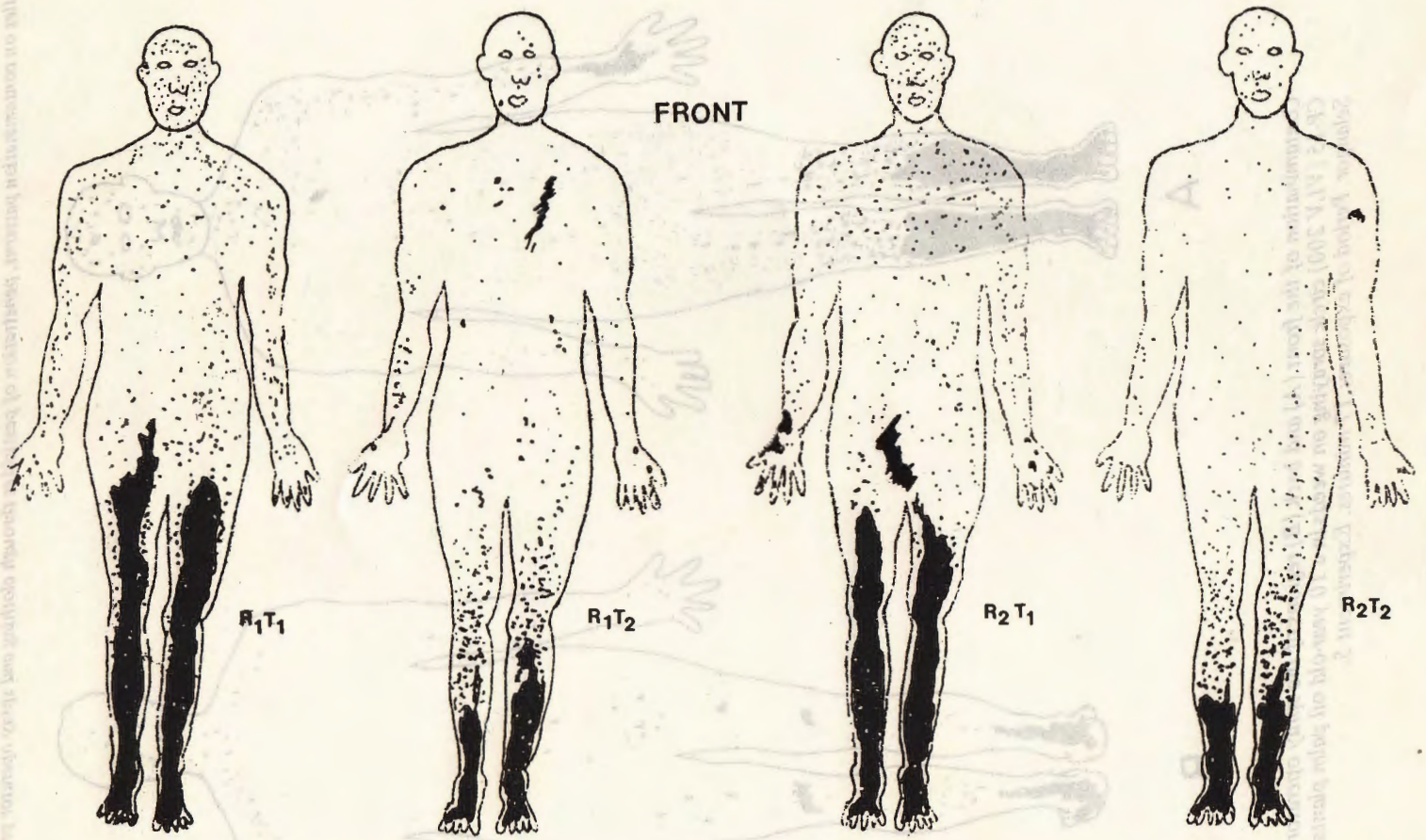

*Contamination of 6 pairs of gloves worn by 6 farmers (W1-W6) during mixing and loading of u/v dye concentrate. Shaded areas show the dye due to spillage or cross-contamination. (W1: Worker no. 1, RB = Back of right hand, LB = Back of left hand. RP = Palm of right hand, LP = Palm of left hand. The same system for the rest). Period of exposure: 30 seconds. Experiment 1.*



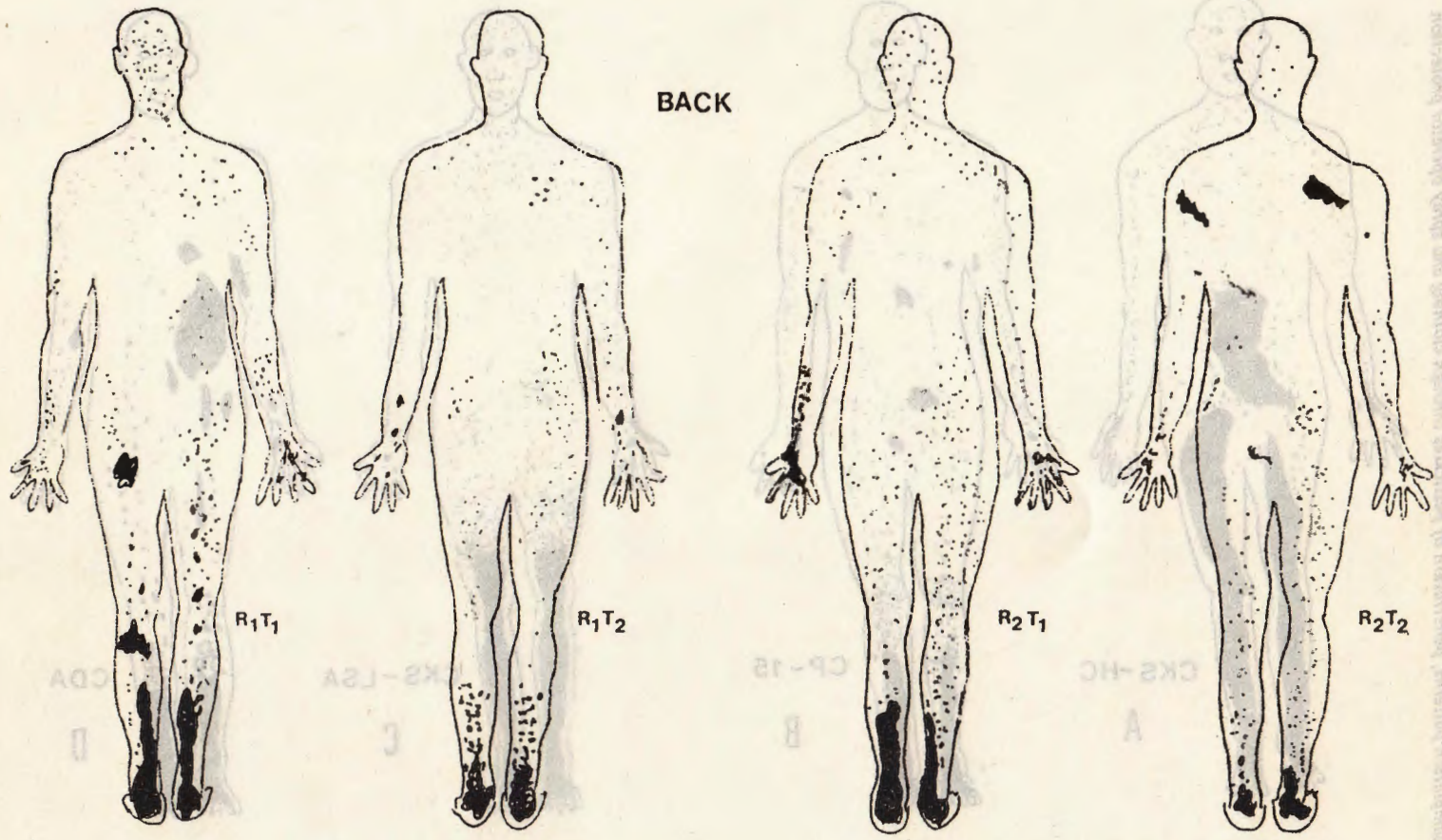

*Contamination pattern during conventional knapsack spraying (cone nozzle) of ferns on the trunks of oil palm. Period of exposure: 5 minutes. Experiment 7.*
*A: Front B: Back.*



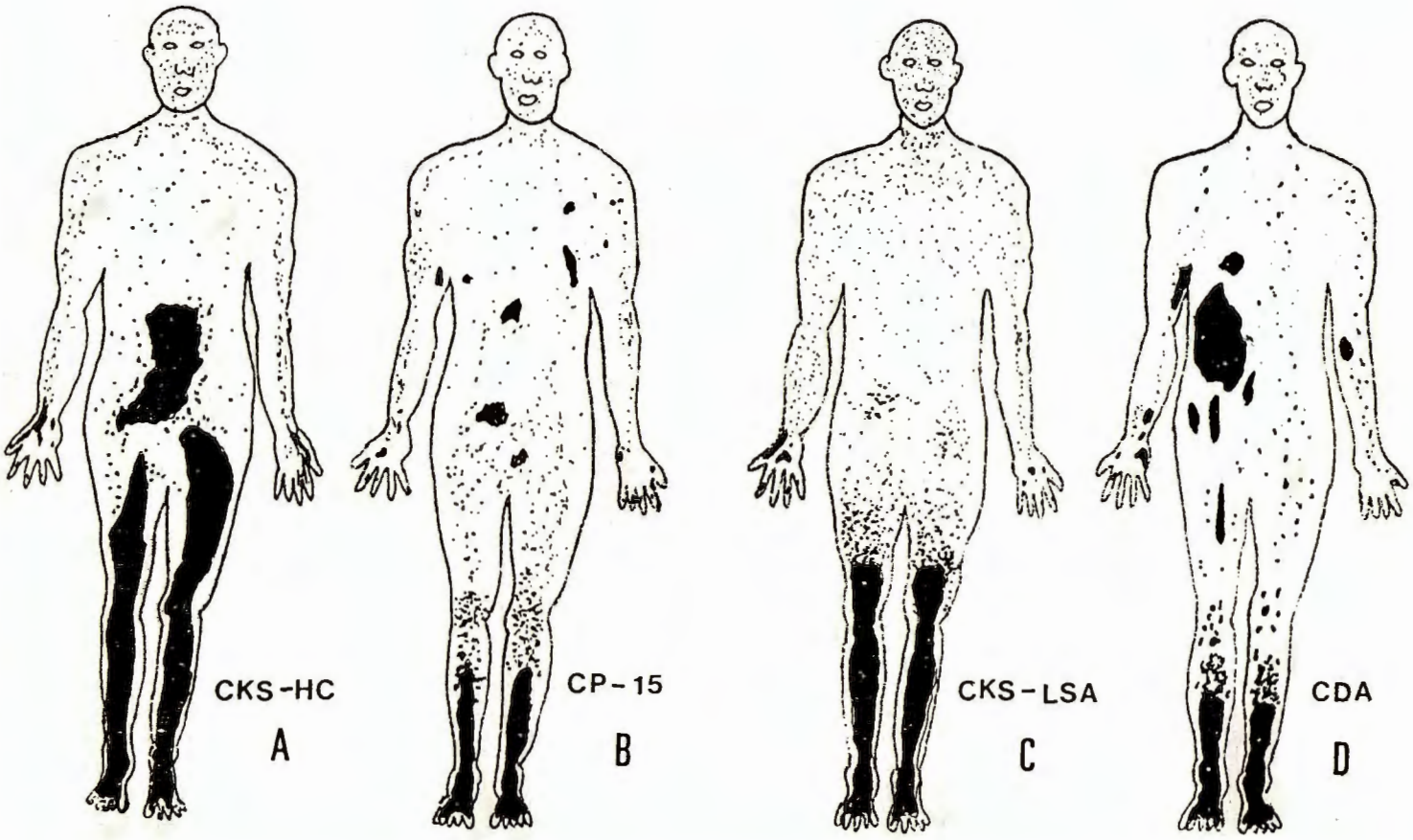

*Contamination of the front (A) and back (B) regions of the spray operator during routine CP-15 (VLV 200) circle spraying on weeds in a 10 year-old oil palm plantation, Kuala Selangor. Period of exposure: 17 minutes. Experiment 5.*



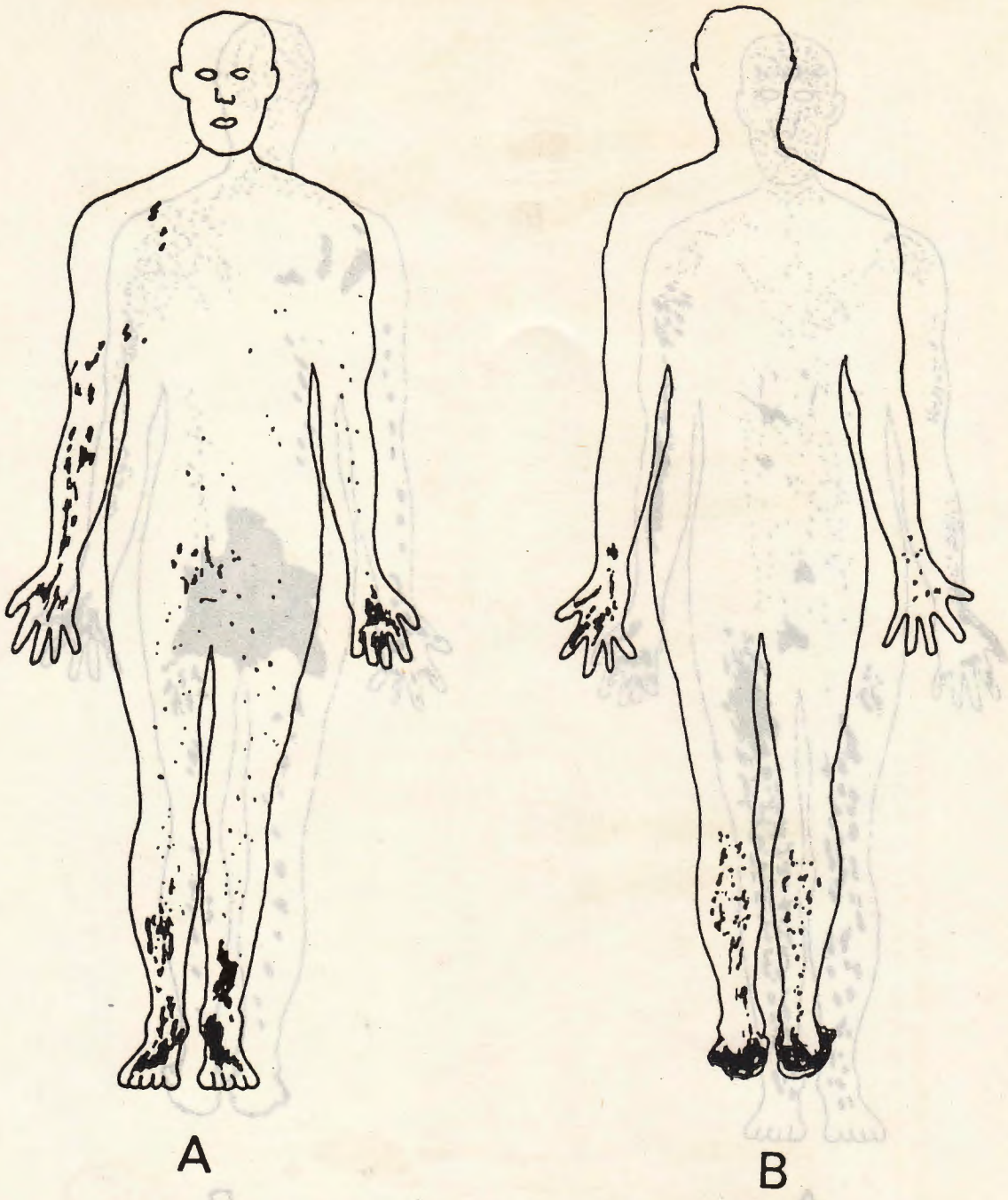

*Front regions of two pairs of spray operators showing reduced contamination when staput was added. Circle spraying on weeds in immature rambutan. T1: Control T2: With staput. R: Replicates 1 and 2 Period of exposure: 13.5 minutes. Experiment 4.*




*Back regions of the corresponding two pairs of spray operators showing reduced contamination when staput was added. Circle spraying on weeds in immature rambutan. T1: Control T2: With Staput R: Replicates 1 and 2. Period of exposure: 13.5 minutes. Experiment 4.*




*Contamination of the front regions of four spray operators during circle spraying on weeds in immature rambutan. CKS-HC (Conventional knapsack sprayer with hollow cone nozzle), CP-15 (Copper-Peglar VLV 100 nozzle), CKS-LSA (with LSA-4 hole nozzle), and CDA (Micron Herbi 77, red nozzle). Period of exposure: 10 minutes. Experiment 3.*




*Mixing/loading of u/v dye powder into the spray tank resulted in contamination of hands, arms, waist, thighs, shanks and feet. Period of exposure: 5 minutes. Experiment 2.*

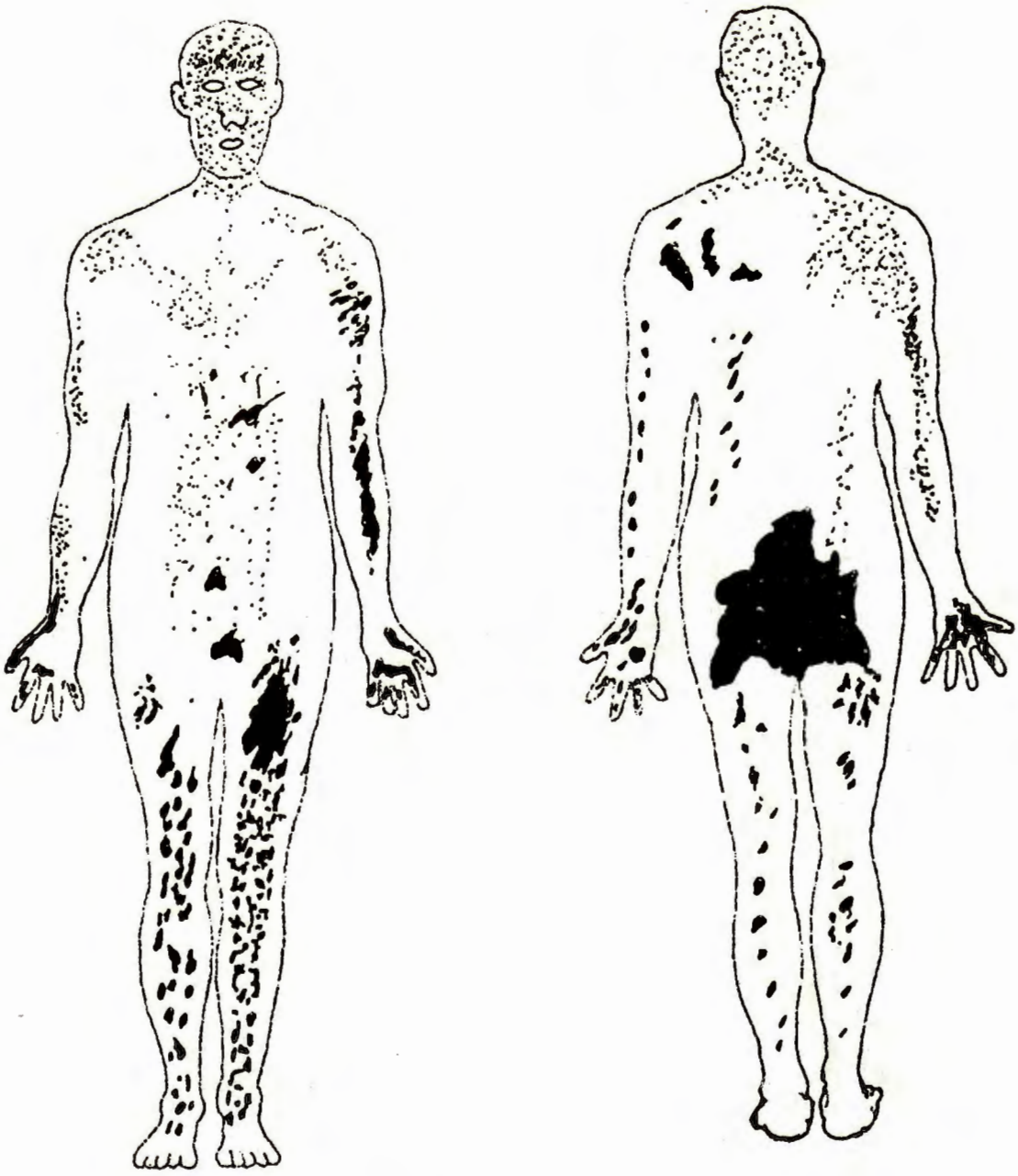



*Figure 8a. Contamination pattern during spraying of fruits and leaves of the snake gourd. Period of exposure: 13 minutes. Experiment 8.*
*A: Front B: Back.*

## Appendix 5:

INTERNATIONAL LABOUR CONFERENCE

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**Convention 170**

# CONVENTION CONCERNING SAFETY IN THE USE OF CHEMICALS AT WORK

The General Conference of the International Labour Organisation,

Having been convened at Geneva by the Governing Body of the International Labour Office, and having met in its 77th Session on 6 June 1990, and

Noting the relevant international labour Conventions and Recommendations and, in particular, the Benzene Convention and Recommendation, 1971, the Occupational Cancer Convention and Recommendation, 1974, the Working Environment (Air Pollution, Noise and Vibration) Convention and Recommendation, 1977, the Occupational Safety and Health Convention and Recommendation, 1981, the Occupational Health Services Convention and Recommendation, 1985, the Asbestos Convention and Recommendation, 1986, and the list of occupational diseases, as amended in 1980, appended to the Employment Injury Benefits Convention, 1964, and

Noting that the protection of workers from the harmful effects of chemicals also enhances the protection of the general public and the environment, and

Noting that workers have a need for, and right to, information about the chemicals they use at work, and

Considering that it is essential to prevent or reduce the incidence of chemically induced illnesses and injuries at work by:

*(a)* ensuring that all chemicals are evaluated to determine their hazards;

*(b)* providing employers with a mechanism to obtain from suppliers information about the chemicals used at work so that they can implement effective programmes to protect workers from chemical hazards;

*(c)* providing workers with information about the chemicals at their workplaces, and about appropriate preventive measures so that they can effectively participate in protective programmes;

*(d)* establishing principles for such programmes to ensure that chemicals are used safely, and

Having regard to the need for co-operation within the International Programme on Chemical Safety between the International Labour Organisation, the United Nations Environment Programme and the World Health Organisation as well as with the Food and Agriculture Organisation of the United Nations and the United Nations Industrial Development Organisation, and noting the relevant instruments, codes and guide-lines promulgated by these organisations, and

Having decided upon the adoption of certain proposals with regard to safety in the use of chemicals at work, which is the fifth item on the agenda of the session, and

Having determined that these proposals shall take the form of an international Convention;

adopts this twenty-fifth day of June of the year one thousand nine hundred and ninety the following Convention, which may be cited as the Chemicals Convention, 1990:

## PART I. SCOPE AND DEFINITIONS

*Article 1*

1. This Convention applies to all branches of economic activity in which chemicals are used.

2. The competent authority of a Member ratifying this Convention, after consulting the most representative organisations of employers and workers concerned, and on the basis of an assessment of the hazards involved and the protective measures to be applied:

*(a)* may exclude particular branches of economic activity, undertakings or products from the application of the Convention, or certain provisions thereof, when:

(i) special problems of a substantial nature arise; and

(ii) the overall protection afforded in pursuance of national law and practice is not inferior to that which would result from the full application of the provisions of the Convention;

*(b)* shall make special provision to protect confidential information whose disclosure to a competitor would be liable to cause harm to an employer's business so long as the safety and health of workers are not compromised thereby.

3. This Convention does not apply to articles which will not expose workers to a hazardous chemical under normal or reasonably foreseeable conditions of use.

4. This Convention does not apply to organisms, but does apply to chemicals derived from organisms.

*Article 2*

For the purposes of this Convention:

*(a)* the term "chemicals" means chemical elements and compounds, and mixtures thereof, whether natural or synthetic;

*(b)* the term "hazardous chemical" includes any chemical which has been classified as hazardous in accordance with Article 6 or for which relevant information exists to indicate that the chemical is hazardous;

*(c)* the term "use of chemicals at work" means any work activity which may expose a worker to a chemical, including:

(i) the production of chemicals;

(ii) the handling of chemicals;

(iii) the storage of chemicals;

(iv) the transport of chemicals;

(v) the disposal and treatment of waste chemicals;

(vi) the release of chemicals resulting from work activities;

(vii) the maintenance, repair and cleaning of equipment and containers for chemicals;

*(d)* the term "branches of economic activity" means all branches in which workers are employed, including the public service;

*(e)* the term "article" means an object which is formed to a specific shape or design during its manufacture or which is in its natural shape, and whose use in that form is dependent in whole or in part on its shape or design;

*(f)* the term "workers' representatives" means persons who are recognised as such by national law or practice, in accordance with the Workers' Representatives Convention, 1971.

## PART II. GENERAL PRINCIPLES

*Article 3*

The most representative organisations of employers and workers concerned shall be consulted on the measures to be taken to give effect to the provisions of this Convention.

*Article 4*

In the light of national conditions and practice and in consultation with the most representative organisations of employers and workers, each Member shall formulate, implement and periodically review a coherent policy on safety in the use of chemicals at work.

*Article 5*

The competent authority shall have the power, if justified on safety and health grounds, to prohibit or restrict the use of certain hazardous chemicals, or to require advance notification and authorisation before such chemicals are used.

## PART III. CLASSIFICATION AND RELATED MEASURES

*Article 6*

CLASSIFICATION SYSTEMS

1. Systems and specific criteria appropriate for the classification of all chemicals according to the type and degree of their intrinsic health and physical hazards and for assessing the relevance of the information required to determine whether a chemical is hazardous shall be established by the competent authority, or by a body approved or recognised by the competent authority, in accordance with national or international standards.

2. The hazardous properties of mixtures composed of two or more chemicals may be determined by assessments based on the intrinsic hazards of their component chemicals.

3. In the case of transport, such systems and criteria shall take into account the United Nations Recommendations on the transport of dangerous goods.

4. The classification systems and their application shall be progressively extended.

*Article 7*

LABELLING AND MARKING

1. All chemicals shall be marked so as to indicate their identity.

2. Hazardous chemicals shall in addition be labelled, in a way easily understandable to the workers, so as to provide essential information regarding their classification, the hazards they present and the safety precautions to be observed.

3.(1) Requirements for marking or labelling chemicals pursuant to paragraphs 1 and 2 of this Article shall be established by the competent authority, or by a body approved or recognised by the competent authority, in accordance with national or international standards.

(2) In the case of transport, such requirements shall take into account the United Nations Recommendations on the transport of dangerous goods.

*Article 8*

CHEMICAL SAFETY DATA SHEETS

1. For hazardous chemicals, chemical safety data sheets containing detailed essential information regarding their identity, supplier, classification, hazards, safety precautions and emergency procedures shall be provided to employers.

2. Criteria for the preparation of chemical safety data sheets shall be established by the competent authority, or by a body approved or recognised by the competent authority, in accordance with national or international standards.

3. The chemical or common name used to identify the chemical on the chemical safety data sheet shall be the same as that used on the label.

*Article 9*

RESPONSIBILITIES OF SUPPLIERS

1. Suppliers of chemicals, whether manufacturers, importers or distributors, shall ensure that:

*(a)* such chemicals have been classified in accordance with Article 6 on the basis of knowledge of their properties and a search of available information or assessed in accordance with paragraph 3 below;

*(b)* such chemicals are marked so as to indicate their identity in accordance with Article 7, paragraph 1;

*(c)* hazardous chemicals they supply are labelled in accordance with Article 7, paragraph 2;

*(d)* chemical safety data sheets are prepared for such hazardous chemicals in accordance with Article 8, paragraph 1, and provided to employers.

2. Suppliers of hazardous chemicals shall ensure that revised labels and chemical safety data sheets are prepared and provided to employers, by a method which accords with national law and practice, whenever new relevant safety and health information becomes available.

3. Suppliers of chemicals which have not yet been classified in accordance with Article 6 shall identify the chemicals they supply and assess the properties of these chemicals on the basis of a search of available information in order to determine whether they are hazardous chemicals.

## PART IV. RESPONSIBILITIES OF EMPLOYERS

*Article 10*

IDENTIFICATION

1. Employers shall ensure that all chemicals used at work are labelled or marked as required by Article 7 and that chemical safety data sheets have been provided as required by Article 8 and are made available to workers and their representatives.

2. Employers receiving chemicals that have not been labelled or marked as required under Article 7, or for which chemical safety data sheets have not been provided as required under Article 8, shall obtain the relevant information from the supplier or from other reasonably available sources, and shall not use the chemicals until such information is obtained.

3. Employers shall ensure that only chemicals which are classified in accordance with Article 6 or identified and assessed in accordance with Article 9. paragraph 3, and labelled or marked in accordance with Article 7 are used and that any necessary precautions are taken when they are used.

4. Employers shall maintain a record of hazardous chemicals used at the workplace, cross-referenced to the appropriate chemical safety data sheets. This record shall be accessible to all workers concerned and their representatives.

*Article 11*

TRANSFER OF CHEMICALS

Employers shall ensure that when chemicals are transferred into other containers or equipment, the contents are indicated in a manner which will make known to workers their identitv, any hazards associated with their use and any safety precautions to be observed.

*Article 12*

EXPOSURE

Employers shall:

*(a)* ensure that workers are not exposed to chemicals to an extent which exceeds exposure limits or other exposure criteria for the evaluation and control of the working environment established by the competent authority, or by a body approved or recognised by the competent authority, in accordance with national or international standards;

*(b)* assess the exposure of workers to hazardous chemicals;

*(c)* monitor and record the exposure of workers to hazardous chemicals when this is necessary to safeguard their safety and health or as may be prescribed by the competent authority;

*(d)* ensure that the records of the monitoring of the working environment and of the exposure of workers using hazardous chemicals are kept for a period prescribed by the competent authority and are accessible to the workers and their representatives.

*Article 13*

OPERATIONAL CONTROL

1. Employers shall make an assessment of the risks arising from the use of chemicals at work, and shall protect workers against such risks by appropriate means, such as:

*(a)* the choice of chemicals that eliminate or minimise the risk;

*(b)* the choice of technology that eliminates or minimises the risk;

*(c)* the use of adequate engineering control measures;

*(d)* the adoption of working systems and practices that eliminate or minimise the risk;

(e) the adoption of adequate occupational hygiene measures;

(f) where recourse to the above measures does not suffice, the provision and proper maintenance of personal protective equipment and clothing at no cost to the worker, and the implementation of measures to ensure their use.

2. Employers shall:

(a) limit exposure to hazardous chemicals so as to protect the safety and health of workers;

(b) provide first aid;

(c) make arrangements to deal with emergencies.

*Article 14*

DISPOSAL

Hazardous chemicals which are no longer required and containers which have been emptied but which may contain residues of hazardous chemicals, shall be handled or disposed of in a manner which eliminates or minimises the risk to safety and health and to the environment, in accordance with national law and practice.

*Article 15*

INFORMATION AND TRAINING

Employers shall:

(a) inform the workers of the hazards associated with exposure to chemicals used at the workplace;

(b) instruct the workers how to obtain and use the information provided on labels and chemical safety data sheets;

(c) use the chemical safety data sheets, along with information specific to the workplace, as a basis for the preparation of instructions to workers, which should be written if appropriate;

(d) train the workers on a continuing basis in the practices and procedures to be followed for safety in the use of chemicals at work.

*Article 16*

CO-OPERATION

Employers, in discharging their responsibilities, shall co-operate as closely as possible with workers or their representatives with respect to safety in the use of chemicals at work.

## PART V. DUTIES OF WORKERS

*Article 17*

1. Workers shall co-operate as closely as possible with their employers in the discharge by the employers of their responsibilities and comply with all procedures and practices relating to safety in the use of chemicals at work.

2. Workers shall take all reasonable steps to eliminate or minimise risk to themselves and to others from the use of chemicals at work.

## PART VI. RIGHTS OF WORKERS AND THEIR REPRESENTATIVES

*Article 18*

1. Workers shall have the right to remove themselves from danger resulting from the use of chemicals when they have reasonable justification to believe there is an imminent and serious risk to their safety or health, and shall inform their supervisor immediately.

2. Workers who remove themselves from danger in accordance with the provisions of the previous paragraph or who exercise any other rights under this Convention shall be protected against undue consequences.

3. Workers concerned and their representatives shall have the right to:

*(a)* information on the identity of chemicals used at work, the hazardous properties of such chemicals, precautionary measures, education and training;

*(b)* the information contained in labels and markings;

*(c)* chemical safety data sheets;

*(d)* any other information required to be kept by this Convention.

4. Where disclosure of the specific identity of an ingredient of a chemical mixture to a competitor would be liable to cause harm to the employer's business, the employer may, in providing the information required under paragraph 3 above, protect that identity in a manner approved by the competent authority under Article 1, paragraph 2 *(b)*.

## PART VII. RESPONSIBILITY OF EXPORTING STATES

*Article 19*

When in an exporting member State all or some uses of hazardous chemicals are prohibited for reasons of safety and health at work, this fact and the reasons for it shall be communicated by the exporting member State to any importing country.

*Article 20*

The formal ratifications of this Convention shall be communicated to the Director-General of the International Labour Office for registration.

*Article 21*

1. This Convention shall be binding only upon those Members of the International Labour Organisation whose ratifications have been registered with the Director-General.

2. It shall come into force twelve months after the date on which the ratifications of two Members have been registered with the Director-General.

3. Thereafter, this Convention shall come into force for any Member twelve months after the date on which its ratification has been registered.

*Article 22*

1. A Member which has ratified this Convention may denounce it after the expiration of ten years from the date on which the Convention first comes into force, by an act communicated to the Director-General of the International Labour

Office for registration. Such denunciation shall not take effect until one year after the date on which it is registered.

2. Each Member which has ratified this Convention and which does not, within the year following the expiration of the period of ten years mentioned in the preceding paragraph, exercise the right of denunciation provided for in this Article, will be bound for another period of ten years and, thereafter, may denounce this Convention at the expiration of each period of ten years under the terms provided for in this Article.

*Article 23*

1. The Director-General of the International Labour Office shall notify all Members of the International Labour Organisation of the registration of all ratifications and denunciations communicated to him by the Members of the Organisation.

2. When notifying the Members of the Organisation of the registration of the second ratification communicated to him, the Director-General shall draw the attention of the Members of the Organisation to the date upon which the Convention will come into force.

*Article 24*

The Director-General of the International Labour Office shall communicate to the Secretary-General of the United Nations for registration in accordance with Article 102 of the Charter of the United Nations full particulars of all ratifications and acts of denunciation registered by him in accordance with the provisions of the preceding Articles.

*Article 25*

At such times as it may consider necessary the Governing Body of the International Labour Office shall present to the General Conference a report on the working of this Convention and shall examine the desirability of placing on the agenda of the Conference the question of its revision in whole or in part.

*Article 26*

1. Should the Conference adopt a new Convention revising this Convention in whole or in part, then, unless the new Convention otherwise provides:

*(a)* the ratification by a Member of the new revising Convention shall *ipso jure* involve the immediate denunciation of this Convention, notwithstanding the provisions of Article 22 above, if and when the new revising Convention shall have come into force;

*(b)* as from the date when the new revising Convention comes into force this Convention shall cease to be open to ratification by the Members.

2. This Convention shall in any case remain in force in its actual form and content for those Members which have ratified it but have not ratified the revising Convention.

*Article 27*

The English and French versions of the text of this Convention are equally authoritative.

Appendix 6:

# Selected List For Further Reading*

## A: General Topics/ Background

1. Bull, David, A Growing Problem: Pesticides and the Third World Poor, OXFAM, Oxford, 1982, 192 pp.

A well documented book on the hazards and consequences of the widespread use of pesticides in the Third World with a series of practical proposals for action by governments, industry and international organisations. Available from: OXFAM, 274 Banbury Road, Oxford OX2 7DZ, United Kingdom. Price: £4.95.

2. Goldenman, Gretta, and Rengam, Sarojini, Pesticides and You: 44 Questions and Answers, IOCU and PAN, Penang, 1989.

In a concise, easy-to-read question and answer format, the book gives an overview of the issues and answers to 44 of the most widely asked questions on pesticides, their health and environmental effects, alternatives, biotechnology and the pesticide industry. Available from: IOCU, PO Box 1045, 10830 Penang, Malaysia. Price: US$4.00.

3. Goldenman, Gretta, and Rengam, Sarojini, Problem Pesticides, Pesticide Problems: A Citizens' Action Guide to the International Code of Conduct on the Distribution and Use of Pesticides, completely revised second edition, IOCU and PAN, Penang, 1988, 183 pp.

The guide, a campaign tool, helps citizens' groups measure the pesticide-related practices of governments, the pesticide industry and pesticide user against the standards of FAO's Pesticide Code. It seeks to build citizen awareness and to generate pressure needed to strengthen government regulations and to urge the pesticide industry to act responsibly. Available from: IOCU, P.O. Box 1045, 10830 Penang, Malaysia. Price: US$10.00.

4. Lang, Tim, and Clutterbuck, Charlie, P is for Pesticides, Ebury Press, London, 1991, 192 pp.

The book written in association with the Pesticides Trust, UK, challenges official complacency and secrecy surrounding the use of pesticides, pinpoints the most hazardous ones, and outlines where you can expect to find them, what their effects are and how to control them. Suggestions for safe, practical alternatives are also provided. Available from: Ebury Press, Random Century House, 20 Vauxhall Bridge Road, London SWIV 2SA, U.K. Price: £6.99.

5. Marquardt, Sandra and Glassman, Laura, Never-Registered Pesticides: Rejected Toxics Join the "Circle of Poison", Greenpeace, Washington, D.C., 1990, 24 pp.

Four case studies of pesticides manufactured by DowElanco, Mobay Corporation and Monsanto Agricultural Company. These pesticides; butachlor, haloxyfop-methyl, nuarimol and prothiophos were rejected by the U.S. Environmental Protection Agency because of health or environmental concerns, but are still manufactured and exported. Available from: Greenpeace, USA, 1436, U St., NW, Washington, D.C., 20009, USA.

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* For bulk orders of more than 10 copies of each of these posters, you may first request a sample postcard version.

6. Norris, Ruth, ed., Pills, Pesticides and Profits: The International Trade in Toxic Substances, North River Press Inc, Croton- on-Hudson, New York, 1982, 182 pp.

Provides carefully documented evidence on the export of products banned p73 or severely restricted in the U.S., especially pharmaceuticals and pesticides, to other countries. Also includes the transcripts of two television documentaries covering the same topic. Available from: Council on International and Public Affairs, 777 United Nations Plaza, New York, NY 10017, USA and IOCU, PO Box 1045, 10830 Penang, Malaysia. Price: US$7.95.

7. "Pesticides Don't Know When to Stop Killing," (Kit). PAN North America Regional Center, San Francisco, 1985.

This kit is designed to serve as a source of useful materials for groups active in the PAN network, or others interested in supporting PAN's global campaign against the misuse of pesticides. It consists of a press release, 12 data sheets, three background articles on pesticide problems, a list of resource organisations, a paper on alternatives to pesticides, a list for further information on intergrated pest management, three photos and three graphic items, a "Dirty Dozen" poster and a PAN brochure. Available from: PAN, North America Regional Center, 965 Mission Street, Suite #514, San Francisco, CA 94103, USA. Price: US$10.00.

8. Weir, David and Schapiro, Mark, Circle of Poison: Pesticides and People in a Hungry World, Institute for Food and Development Policy (IFDP), San Francisco, 1981, 99 pp.

Documents the international marketing of pesticides that are banned or restricted in their countries of origin and describes how the pesticides come back to these countries as residues in imported foodstuffs. (also available in Spanish) Available from: IFDP, 145 Ninth Street, San Francisco, CA 94105, USA. Price: US$3.95.

## B: Monitoring The Pesticide Code.

9. Goldenman, Gretta, and Rengam, Sarojini, The Pesticide Code Monitor: A Resource Book for Trainers, IOCU and PAN, Penang, 1989, 155 pp.

A step-by-step, practical approach to monitoring the implementation of the FAO Code of Conduct on the Distribution and Use of Pesticides. Available from: IOCU, PO Box 1045, 10830 Penang, Malaysia. Price: US$10.00.

10. Moses, Marion. Monitoring the International Code of Conduct on the Use and Distribution of Pesticides in North America: A Field Survey of Pesticide-Related Working Conditions in Four Locations in the U.S. and Canada, PAN North America Regional Center, San Francisco, 1988, 26 pp.

The regional report for North America is available from: PAN North America Regional Center, 965 Mission Street, Suite #514, San Francisco, CA 94103, USA.

## C: Asia Focus/Africa Focus

11. Foo, Gaik Sim, The Pesticide Poisoning Report: A Survey of Some Asian Countries, IOCU, Penang, 1985, 80 pp.

The study examines the prevalence of pesticide poisoning in four countries in Asia (Indonesia, Malaysia, Sri Lanka and Thailand) and what authorities are doing to keep tabs on the problem. The report makes extensive recommendations for getting a handle on the growing epidemic. Available from: IOCU, PO Box 1045, 10830 Penang, Malaysia. Price: US$8.00. p73

12. Handbook on the Use of Pesticides in the Asia-Pacific Region, Asian Development Bank (ADB), Manila, 1987, 294 pp.

It is designed to guide Asian Development Bank (ADB) staff and government officials in the selection, procurement, and safe and cost-effective use of pesticides. Available from: ADB, PO Box 789, Manila, Philippines.

13. Oudejans, J.H. and Staring, W.D.E., eds., ARSAP Agro-pesticide Index 1984: A Directory of Common and Trade Names of Agro-Pesticides Compiled for the Asia-Pacific Region, Economic and Social Commission for the Asia & the Pacific, Bangkok, 1984, 43 pp.

Contains common names and trade names of pesticides which are being used in Afghanistan, Bangladesh, Burma, India, Indonesia, Malaysia, Nepal, Pakistan, Papua New Guinea, Philippines, Sri Lanka and Thailand. Available from: The ARSAP/FADINAP Project, ESCAP, United Nations Building, Rajadamnern Avenue, Bangkok 10200, Thailand.

14. Pesticide Dilemma in the Third World: A Case Study of Malaysia, Sahabat Alam Malaysia, Penang, 1984, 77 pp.

Describes the present pattern of use of pesticides in Malaysia and emphasises on the need to prohibit the sale of hazardous pesticides banned in other countries. Available from: SAM (Friends of the Earth, Malaysia) 43 Salween Road, 10050 Penang, Malaysia. Price: M$5.00.

15. Pesticide Problems, Legislation and Consumer Action in the Third World - The Malaysian Experience, Consumers' Association of Penang, Penang, 1985, 79 pp.

Gives a detailed account of the many problems facing humans and the environment arising from heavy pesticide use. It also examines the role of pesticide MNCs in the Third World and presents an overview of pesticide legislation in Malaysia. Available from: Consumers' Association of Penang, 87 Cantonment Road, 10250 Penang, Malaysia. Price: M$5.00

16. Riza, Tjahjadi, Pengendalian Hama Alternatif: Lewat Pertanian Kampungan, PAN Indonesia/ WALHI, Jakarta, Seri 2, 1988, 94 pp.

The book is a compilation of research and reflections into pest control techniques that combine traditional knowledge and wisdom of farmers with modern pest control methods without the use of pesticides. Available in Bahasa Indonesia from: PAN Indonesia, Jalan Talang 15, Jakarta 10320, Indonesia.

17. Staring, W.D.E., Pesticide Data Collection Systems and Supply, Distribution and Use in Selected Countries of the Asia-Pacific Region, Economic and Social Commission for Asia and the Pacific, Bangkok, 1984, 223 pp.

Provides reliable data on the supply, distribution and use of agro-pesticides. This data was compiled by ESCAP's Agricultural Division to help governments assess the actual need for agro-pesticides and current practices in their supply and use. Available from: The ARSAP/FADINAP Project, ESCAP, United Nations Building, Rajadamnern Avenue, Bangkok 10200, Thailand.

## D: Sustainable Agriculture/Organic Farming

18. Gips, Terry. Breaking the Pesticide Habit: Alternatives to Twelve p73 Hazardous Pesticides, International Alliance for Sustainable Agriculture, Minneapolis, 1987, and IOCU, Penang, 1990, 348 pp.

Describes alternatives to the pesticides included in Pesticide Action Network's "Dirty Dozen" campaign. Available from: IASA, Newman Center at the University of Minnesota, 1701 University Ave. S.E., Room 202, Minneapolis MN 55414, USA, and IOCU, PO Box 1045, 10830 Penang, Malaysia. Price: US$20.00 (individual), US$15.00 (members, PAN participants), US$27.00 (institutions).

19. Hansen, Michael, Escape from the Pesticide Treadmill: Alternatives to Pesticides in Developing Countries, Consumer Policy Institute, NY, 1988, and IOCU, Penang, 1988, 185 pp.

Documents six successful case studies on alternatives to pesticides that are economically viable, often more profitable to the farmer, and have been successfully applied on a large scale for agricultural production in developing countries. The studies include control of pests in cassava in Africa, soybeans in Brazil, bananas in Costa Rica, cotton in Nicaragua, rice in South East Asia and coconuts in the South Pacific. Available from: Consumer Policy Institute, Consumers Union, 101 Truman Avenue, Yonkers, NY 10553, USA, and IOCU, PO Box 1045, 10830 Penang, Malaysia. Price: US$12.00.

## E: Pesticide Poisonings/Human Health

20. Health and Workers Group, Will My Work Make Me Sick?: A Preliminary report on the Effects of Pesticides and Other Agro-chemicals on Banana and Pineapple Plantation Workers in the Philippines, Council for Primary health Care, Manila, 1985, 96 pp.

Describes the working conditionsof banana and pineapple plantation workers in the Philippines, their exploitation by TNCs who operate these plantations and the extent of work related illnesses among the workers especially from the adverse effects of pesticides. Also gives recommendations on workplace strategy to control these chemical hazards. The appendix includes information on the pesticides used here and the "Dirty Dozen"Campaign. Available from: Health and Workers Group, Council for PrimaryHealth Care, PO Box SM-463, Sta Mesa, Manila, Philippines. Price: US$1.50.

21. Weinstein, Sidney, Fruits of Your Labour: A Guide to Pesticide Hazards for California Field Workers, Labor Occupational Health Programme, University of California, Berkeley, 1984.

Contains data on potential dangers of 60 most toxic pesticides which field workers are apt to encounter in California. Also includes lists of potential efects of pesticides frequently used on 26 Californian crops and their regulations and warnings. Available from: :Labor Occupational Health Programme, Institute of Industrial Relations, University of California, Berkeley, CA 94620, USA.

## F: FAO Pesticide Code

22. International Code of Conduct on the Distribution and Use of Pesticides (amended version), FAO, Rome, 1990.

Available from: Food and Agriculture Organization (FAO), Via delle Terme di Caracalla, 00100 Rome, Italy, Price: Free. p73

23. Guidelines for the Disposal of Waste Pesticide and Pesticide Containers on the Farm, FAO, Rome, 1985.

24. Guidelines for the Packaging and Storage of Pesticides, FAO, Rome, 1985.

25. Guidelines for the Registration and Control of Pesticides (including a model scheme for the establishment of national organizations), FAO, Rome, 1985.

26. Guidelines on Efficacy Data for the Registration of Pesticides for Plant Protection, FAO, Rome, 1985.

27. Guidelines on Environmental Criteria for the Registration of Pesticides, FAO, Rome, 1985.

28. Guidelines on Good Labelling Practice for Pesticides, FAO, Rome, 1985.

FAO has issued a series of guides designed to aid countries in developing effective pesticide regulatory mechanisms. The guidelines are based on extensive experience in many countries, under widely differing conditions where regulatory procedures have been operating. These guides provide useful details not always supplied by the Pesticide Code. Available from: FAO, Via delle Terme di Caracalla, 00100 Rome, Italy. Price: Free.

## G. Audio Visual Aids

### Films

29. Bitter Harvest: Pesticides and the Third World, Narration by Michael Drew, 60 slides/tape, 22 mins, colour. Also available on video. Produced by the International Centre for Conservation Education, Cheltenham, UK for the Environment Liaison Centre International, Nairobi, Kenya, 1987. Narration

It summarizes the dangers associated with pesticide use and pays particular attention to ways of reducing pesticide dependence and the urgent need to control the export to and use of unacceptable hazardous products in developing coun tries. Available from: Conservation Education Services Ltd, Greenfield House, Guiting Power, Cheltenham, Glos. GL54 5TZ, UK. Price: £18.25 (for slide-pack and cassette narration with script notes) and £18.90 (on BETA format or PAL video cassette).

30. Pesticides and Pills: For Export Only, (Part I), 16mm film, 57 minutes, colour, Robert Richter Productions, New York, 1981.

Exposes the export of highly toxic pesticides that have been banned in the U.S. and other industrialized countries to the Third World. Available from: Robert Richter Productions, 330 W 42nd Street, New York, NY 10036, USA.

31. Profits from Poison: Pesticides and IPM in Asia, Video, 30 mins, colour, Television Trust for the Environment, London, 1987.

Filmed in Thailand and the Philippines, it takes a close look at alternatives to pesticides, why they are necessary and why they are not being developed as fast as they should be. Available from: Television p73 Trust for the Environment, 46 Charlotte Street, London WIP ILX, UK.

32. The Hazards of Pesticides, 140 slides/tape, 32 mins, colour, International Federation of Plantation, Agricultural and Allied Workers (IFPAAW), Geneva, 1986.

Provides an overview of the problem of indiscriminate use of pesticides, documents the "circle of poison" where exports of banned and restricted pesticides to the Third World return to the industrialized countries in their food imports and includes information about the "Dirty Dozen" Campaign. It also gives ideas and solutions on how these problems can be effectively overcome. Available from: IFPAAW, 17 rue Necker, CH-102 Geneva, Switzerland.

## Posters

33. Circle of Poison: What Goes Around Comes Around. Poster. By Doug Minkler, original, seven-colour, hand silk-screened (51 cm x 66 cm).

Available from: PAN North America Regional Center, 965 Misssion Street, Suite #514, San Francisco, CA 94103, USA. Price: US$18.00.

34. Demise of the Dirty Dozen, Poster, 1989.

Chart listing banning and severe restrictions of "Dirty Dozen" pesticides in 60 countries. Includes resource list and action ideas. Available from: PAN North America Regional Center, 965 Mission Street, Suite #514, San Francisco, CA 94103, USA. Price: US$3.00

35. Pesticides Don't Know When to Stop Killing: Fight the Dirty Dozen Worldwide, Poster, Colour, 56cm by 43 cm, Public Media Center, San Francisco, 1985.

Poster included in the "Dirty Dozen" information pack. Lists the 12 pesticides involved. Available from: IOCU, PO Box 1045, 10830 Penang, Malaysia and PAN North America Regional Center, 965 Mission Street, Suite #514, San Francisco, CA 94103, USA.

**TENAGANITA** is a women's group in Malaysia. It affirms that women have dignity, want to be free and want to achieve their full potential in society as human beings. Tenaganita believes that the collective power and energy of women can better women's position in society.

Tenaganita, or "women's force", aims to reach out to women workers in the plantations and the industrial sector. By empowering women workers, it hopes that women can begin to understand and value themselves as women and individuals, and stand up for their rights.

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**Pesticide Action Network (PAN) Asia and the Pacific** is the Asia and the Pacific's Regional Centre of PAN International, a worldwide coalition of citizens group and individuals who are opposed to the irrational use of pesticides.

Launched in May 1982 PAN has six regional centres linking over 300 organisations in over 50 countries. PAN aims to raise public awareness about pesticide use by campaigning against highly toxic pesticides and unethical corporate marketing practices. It seeks to encourage effective policies on the manufacture, distribution, sale and use of pesticides, and promote sustainable and safe alternatives to pesticides.

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