

# **PESTICIDES USED IN THE PHILIPPINE BANANA INDUSTRY AND SOME RELEVANT INFORMATION**

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## INTRODUCTION

The Philippine banana issue emerged as an international issue between the Philippines and Japan at the end of the 1970's. 80 to 90% of the bananas produced by US and Japanese transnational corporations on plantations in Mindanao, Philippines is shipped to Japan, and the banana production has been causing serious problems. Several researches have been done on the Philippine banana industry<sup>1</sup>, and now we may categorize major problems as follows:

- (1) labor exploitation
- (2) environmental destruction by chemicals
- (3) oppression of labor leaders
- (4) health hazards caused by pesticides to both workers and consumers

The issue was first raised in Japan in 1980 when one of Mindanao banana workers visited several major cities in Japan and addressed the issue to Japanese citizens. Among others, the reality of pesticide use shocked the Japanese audience as it involved Japanese consumers as well as Filipino workers.

Some of the previously introduced researches touched upon the pesticide problem<sup>2</sup>. In addition there are some other researches which primarily deal with the pesticide problem on banana plantations<sup>3</sup>. Furthermore banana plantation workers themselves are becoming increasingly conscious of health hazards caused by the chemicals they handle. They have organized the health committee on each plantation and health officers gather information on the chemicals.

The present paper is an effort to identify pesticides used in the Philippine banana industry and to provide consumers and workers with some useful information about the pesticides.

## CHAPTER 1     PESTICIDES USED IN THE PHILIPPINE BANANA INDUSTRY<sup>\*1</sup>

Table 1 shows the basic data of 50 banana pesticides known to us. Table 2 shows toxicity, complaints of workers and accidents and other news regarding the pesticides. Finally Table 3 shows legislative or regulative actions taken of the pesticides in different countries.

PESTICIDES USED IN THE PHILIPPINE BANANA INDUSTRY

**Table 1 Profile of banana pesticides**

num- ber	trade name	generic name	*main use	**chemical type	***physical state	maker	****date of con- firmation of use
(WHO classification: extremely hazardous)							
1	Nemacur	phenamifos	N	OP	G	Bayer Philippine (W.Germany)	Aug. 22, 1986
2	Temik	aldicarb	N	CA		Union Carbide (USA)	Aug. 24, 1986
3	Mocap	ethoprop	N	OP			Aug., , 1986
4	Fumazon	DBCP	F				Feb. 22, 1986
5	Penn cap M	parathion methyl	I	OP			Aug. 19, 1986
6	Counter 10	terbufos	N	OP	G		Dec. 12, 1986
7	Difolatan	captafol	F				1984
8	Dimecron	phosphamidon	I	OP			Apr. 3, 1986
(WHO classification: highly hazardous)							
9	Furadan	carbofuran	N	CA			Apr. 3, 1986
10	Dupon 1179	methomyl	I	CA			Apr. 3, 1986
11	Azudrin	monocrotophos	I	OP			Nov. , 1984
12	Primicid	pirimiphos-ethyl	I	OP			1982
13	Supracide	methidathion	I	OP			1984
(WHO classification: moderately hazardous)							
14	Gramoxone	paraquat	H	DH	L		Dec. 12, 1986
15	Lorsban chemical	chlorpyrifos	I	OP	P	Dow Chemical(USA)	Aug. 18, 1986
	Lorsban 40EC						Aug. 19, 1986
	Lorsban 1-EP						Aug. 24, 1986
16	Sumithaion 50 EC	fenitrothion	I	OP	L		Aug. 24, 1986
17	Smiconbi	fenitrothion	I	OP			Jan. 16, 1986
18	Heptachlor	heptachlor	I	OC			1982
19	Ripcord	cypermethrin	I	PY			before 1982
20	Lindane	$\gamma$ BHC	I	OC			1984
21	Basudin 600EC	diazinon	I	OP			Aug. 19, 1986
(WHO classification: slightly hazardous)							
22	Malathion	malathion	I	OP			Apr. 3, 1986
23	Meltic	TBZ	F		L		Mar. 31, 1985
24	Orthene 400	acephate	I	OP			Jan. 16, 1986
25	Gesapax	ametryne	H	ON			1984
(WHO classification: unlikely to present acute hazard in normal use)							
26	Benlate	Benomyl	F	CA	L		Aug. 24, 1986
27	Dithane M 45	mancozeb	F	DC	P	Rohom & Haas (USA)	Aug. 18, 1986
28	Daconil	chlorothalonil	F				Mar. 31, 1986
29	Hyvar-X	bromacil	H				1984
30	Round-up	glyphosate	H				1984
31	Karmex	diuron	H				1984
32	Vondozeb	maneb + zineb	F	DC			1984
33	Gesaprim 500 FW	atrazine	H	ON			1984
(WHO classification: under study)							
34	Decis 2.5 EC	DECAMITHRIN	I	PY	L	Hoechst Far East (W. Germany)	Aug. 18, 1986
35	Topsin M 17 mg 90 mg	thiophanate-methyl	F		L		Aug. 19, 1986 Aug. 19, 1986

(Continued)

num- ber	trade name	generic name	*main use	**chemical type	***physical state	maker	****date of con- firmation of use
(WHO classification: not classified)							
36	Alum	aluminium phosphide	I/F/R	IC			Apr. 3, 1986
37	Formalin 37%	formaldehyde	F		L		Aug. 19, 1986
38	Monzet	urbacid	F				Nov. , 1984
39	Triton X-45	aapolyether alcohol			L		Aug. 24, 1986
40	Lutensol	ethoxylated fatty alcohol			L		Aug. 24, 1986
41	Banana oil	aromatic oil	F		L		Aug. 24, 1986
42	Methyl bromide	methyl bromide	F	DH	F	Bromine Compounds Ltd, (Israel)	Aug. 28, 1986
43	Methylene chloride	methylene chloride	S	OS	L	ICI (Britain)	Aug. 18, 1986
44	Dominador						Aug. , 1985
45	Ensdin						before 1982
46	Triton B-1956				L		Aug. 24, 1986
47	Masterbuch		F				before 1982
48	Sumicaten		F				Aug. 24, 1986
49	Calitire				L		Mar. 31, 1985
50	Bundoship						

## Note:

\*: N: nematocide; F: fungicide; H: herbicide; I: insecticide; R: rodenticide; S: solvent.

\*\*: OP: organophosphorous compound; CA: carbamate; IC: inorganic compound; DH: dipyridylum herbicide; OS: organic solvent;  
DC: dithiocarbamate; OC: organochlorine compound; ON: organonitrogen herbicide; PY: synthetic pyrethroid.

\*\*\*: G: granule; L: liquid; P: powder; F: fume.

\*\*\*\*: documents available

photograph (Nemacur, Lorsban 1-EP, Dithane M 45, Decis 2.5 EC, Methyl bromide, Methylene chloride).

LIST OF CFI-GSS WORKERS SCHEDULED FOR CHOLINESTERASE LEVEL CHECK-UP IN DAVAO CITY ON JANU-  
ARY 16, 1986 (Basudin, Orthene, Penncap, Sumicombi, Gramoxone, Dimecron).

COST OF HI-USE MATERIALS 19 AUGUST 1986 (Penncap M, Lorsban 40 EC, Basudin 600EC, Topsin M 17 gm, Topsin  
M 90 gm, Gramoxone, Formalin 37%, Formalin 12.33%).

DOLE PHILIPPINES, INC.-STANFILCO DIVISION STATEMENT OF ACCOUNT AS OF JAN. 25 1986 (Fumazon)

**Table 2 Effects of pesticides on workers**

num- ber	trade name (generic name)	toxicity	physical complaints of workers	remarks
1	Nemacur (phenamifos)		reduced body weight; loss of appetite;	
2	Temik (aldicarb)	carcinogenic; fatal if swallowed and can also be fatal if absorbed by the skin or eye.		300 people were poisoned in US and Canada from watermelons sprayed with Temik in July, 1985. 12 toxicologists of the US Environmental Protection Agency (EPA) recommended on January 12, '89 that Temik should not be allowed for bananas to be exported to the country.
3	Mocap (ethoprop)	carcinogenic		
4	Fumazon (DBCP)	mutagenic; sterility carcinogenic; sterilizing	sterility	Workers from a U.S. DBCP plant were sterilized. Workers from Standard Fruit plantations in Costa Rica were identified sterile for life.
5	Penn cap M (parathion methyl)	highly dermal toxic		70 people were killed and 1,564 people were poisoned in Japan in 1953, and 70 people killed and 1887 people poisoned in 1954.
6	Counter 10 (terbufos)			
7	Difolatan (captafol)	mutagenic; carcinogenic		
8	Dimecron (phosphamidon)			
9	Furadan (carbofuran)	can be fatal if swal- lowed or absorbed through the eye.	same as Nemacur; allergy	
10	Dupon 1179 (methomyl)			A tea grower was poisoned to death while spraying in Shizuoka, Japan in 1975.
11	Azudrin (monocrotophos)			Malaysian workers handling highly toxic pesticides such as the weedkiller paraquat, monocrotophos and calcium cyanide, will have to wear protective attire once new regulations are gazetted at the end of 1989 under the Malaysian Pesticides Act of 1974. Employ- ers are to provide the protective gear and equipment to their workers and those who fail to do so will be fined about US\$400 or six months' jail. The regula- tions also require employers to: • keep records of workers involved in the use of pesticides which will be inspected by enforcement officers from time to time; • ensure that a worker does not handle pesticides alone or for more than five hours a day; • institute a medical examination programme for all workers handling pes- ticides; and • train workers on the proper handling of pesticides.
12	Primicid (pirimiphos-ethyl)			
13	Supracide (methidathion)			
14	Gramoxone (paraquat)	no known antidote; mutagenic; ter- atogenic	skin disease; falling nails; irregular nails; amputated leg; eye- sight failure	200 people were killed from 1980 to 1985 in Malaysia. More than 1,000 people were killed every year in Japan.
15	Lorsban chemical (chlorpyrifos) Lors ban 1-EP	highly dermal toxic; mutagenic	pneumonia; turber- crosis	2 professional termite exterminators were killed in Japan in 1986.
16	Sumithaion 50 EC (fenitrothion)	mutagenic; nerve poisoning; teratogenic		
17	Smiconbi (fenitrothion)	— do —		

(Continued)

number	trade name (generic name)	toxicity	physical complaints of workers	remarks
18	Heptachlor (heptachlor)	carcinogenic; accumulative		In U.S. cow's milk and human milk was found polluted by heptachlor in 1982. It was reported that pineapple leaves sprayed with the chemical had been used for cow feed.
19	Ripcord (cypermethrin)			A container with over six tonnes of toxic chemicals, lost in the Channel between England and France, was feared to be resting near a World War Two explosives zone. The container holds one of the world's most dangerous pesticides, <u>Lindane</u> , as well as the pesticides permethrin and <u>cypermethrin</u> .
20	Lindane ( $\gamma$ BHC)	causes genetic mutation; teratogenic		The European Commission is taking Spain to the Court of Justice in Luxembourg for illegally dumping pesticide wastes in violation of four EEC Directives. A Spanish firm, Inquinosa SA, is accused of dumping into an open tip, the persistent and carcinogenic hexachlorocyclohexane (HCH), generated during the production of the pesticide, <u>Lindane</u> .
21	Basudin (diazinon)	mutagenic; carcinogenic; teratogenic	lung disease; allergy; flu	20 people were poisoned to death in Indonesia in 1984.
22	Malathion (malathion)	teratogenic; mutagenic; sterilizing	same as Furadan & Nemacur	A suit was filed by a victim in Japan.
23	Meltic (TBZ)	teratogenic		
24	Orthene 400 (acephate)	mutagenic		
25	Gesapax (ametryne)	mutagenic; carcinogenic; sterilizing		
26	Benlate (benomyl)	carcinogenic; causes genetic mutation; sterilizing	same as Daconil & Basudin; anemia; allergy	Bananas and apples treated with fungicides, mainly Benomil, and other pesticides can lead to genetic mutations in future generations, declared geneticist Flavio Lewgoy, of the University of Rio Grande do Sul, Brazil, at a conference sponsored by the Brazilian Society for the progress of Science. Lewgoy said that even chickens contain pesticide residues, since the grain they are fed is often treated with such chemicals. And although now forbidden, organochlorine pesticides, which have a long lifespan, are still present in the soil on which grain is grown.
27	Dithane M45 (mancozeb)	mutagenic; sterilizing		
28	Daconil (chlorothalonil)	mutagenic; carcinogenic	aplastic anemia; allergy; skin irritation; eye irritation; asthma	
29	Hyvar-X (bromacil)	mutagenic		
30	Round-up (glyphosate)	persistent		
31	Karmex (diuron)			
32	Vondozeb (maneb + zineb)	sterilizing; teratogenic; carcinogenic		
33	Gesaprim 500 FW (atrazine)	mutagenic		
34	Decis 2.5 EC (decamethrin)		inhalation causes faint; skin irritation	
35	Topsin M (thiophanate-methyl)	strongly chronic poisoning; persistent; mutagenic		
36	Alum (aluminium phosphide)		skin irritation	

(Continued)

# PESTICIDES USED IN THE PHILIPPINE BANANA INDUSTRY

number	trade name (generic name)	toxicity	complaints of workers	remarks
37	Formalin (formaldehyde)	carcinogenic	same as Daconil & Benlate	2 casualties were caused by a leakage in Chiba, Japan on Sept. 11, 1986
38	Monzet (urbacid)			
39	Triton X-45 (aapolyether alcohol)			
40	Lutensol (ethoxylated fatty alcohol)			
41	Banana oil (aromatic oil)			
42	Methyl bromide (methyl bromide)			
43	Methylene chloride (methylene chloride)			
44	Dominador			
45	Ensdin			
46	Triton B-1956			
47	Masterbuch	mutagenic; carcino- genic; nerve poison- ing; skin irritation		
48	Sumicaten			
49	Calitire			
50	Bundoship			

Table 3 shows that some of the pesticides are not allowed for use in Japan and most of these pesticides are extremely hazardous. They are Namacur, Temic, Mocap, Fumazon, Penncap M, Dimecron, Furadan, Primicid, Lindane and Decis. As David Weir said in his book, Circle of Poison, dangerous pesticides banned and expelled from industrialized countries eventually return after being used for export crops in third world countries.<sup>2</sup> The case of philippine bananas is one such example.

On the other hand there are some pesticides which are used against the regulations of the Philippine government. They are Fumazon (banned), Dimecron (not registered for banana use), Sumithaion 50 EC (-do-), Heptachlor (- do -), Lindane (- do -), Basudin (- do -), Malathion (- do -), Orthene 400 (- do -) and Methyl bromide (the Fertilizer and Pesticide Authority is instructing plantations not to use it).

**Table 3 Legislative or regulative action****No. 1 Nemacur (phenamifos)**

*Country	Effective date	Description of action taken/grounds for decision
PHL		<u>CONSIDERED TOO HAZARDOUS FOR GENERAL USE. RESTRICTED TO INSTITUTIONAL USE ON BANANA PLANTATIONS ONLY.</u>
TWN		NOT REGISTERED FOR BANANA USE.
JPN		NOT REGISTERED FOR USE.

**No. 2 Temic (aldicarb)**

Country	Effective date	Description of action taken/grounds for decision
AUT	1976	CLASSIFIED AS A "HIGHLY TOXIC POISON". IT MAY BE MANUFACTURED, BOUGHT OR SOLD ONLY WITH A SPECIAL LICENSE AND IS SUBJECT TO CERTAIN PACKAGING AND LABELLING REQUIREMENTS.
SEL	1976	USE IS RESTRICTED TO SPECIALLY AUTHORIZED USERS WITH ADEQUATE EQUIPMENT FOR THE APPLICATION OF THE PRODUCT AND IN POSSESSION OF WAREHOUSES EXCLUSIVELY RESERVED TO STOCKING TOXIC PRODUCTS.
DEU	1974	APPLICATION ONLY ADMISSIBLE IN ORNAMENTAL PLANTS AND SUGAR BEET CULTIVATION, IN TREE NURSERIES, WINE NURSERIES, STRAWBERRY PROPAGATION FACILITIES. THE FRUIT HARVESTED IN THE YEAR OF APPLICATION MUST NOT BE USED. (REFERENCE: (BGBL) BUNDESGESETZBLATT, IS 2335, 1980)
ISR	1978	USE AND SALE BANNED WITHOUT A PERMIT. (REFERENCE: (KOVHT) KOVERZ HA-TAKANOT (OFFICIAL PUBLICATIONS OF REGULATIONS), 3813, 674, 1978)
NOR	1973	CLASSIFIED AS EXTREMELY TOXIC. ALLOWED TO BE SOLD TO AND USED BY AUTHORIZED PERSONS ONLY. REGISTERED FOR USE IN GREENHOUSES ONLY.
PHL		<u>PROHIBITED FOR IMPORT EXCEPT IN CASES OF EMERGENCY AS DETERMINED BY THE AUTHORITIES.</u>
JPN		NOT REGISTERED FOR USE.
USA		APPLIED ONLY BY CERTIFIED TRAINED APPLICATORS OR THOSE UNDER THEIR DIRECT SUPERVISION.

**No. 3 Mocap (ethoprop or ethoprofos)**

Country	Effective date	Description of action taken/grounds for decision
DDR		THIS SUBSTANCE IS NOT PERMITTED IN AGRICULTURAL CHEMICALS.
MYS	1974	UNDER THE PESTICIDES ACT, PRODUCTS CONTAINING THIS ACTIVE INGREDIENT ARE NOT ALLOWED FOR MANUFACTURE, SALE OR IMPORT (EXCEPT FOR RESEARCH OR EDUCATIONAL PURPOSES, IN WHICH CASE THEY REQUIRE AN IMPORT PERMIT AND ARE SUBJECT TO USE WITH CERTAIN RESTRICTIONS). THE COMPOUND IS CONSIDERED TO POSE HAZARDS UNDER LOCAL CONDITIONS OF USE. AUTHORITIES CITE SAFER, CURRENTLY REGISTERED ALTERNATIVE PESTICIDES.
PHL		<u>CONSIDERED TOO HAZARDOUS FOR GENERAL USE. RESTRICTED TO INSTITUTIONAL USE ON BANANA PLANTATIONS ONLY.</u>
TWN		NOT REGISTERED FOR BANANA USE.
JPN		NOT REGISTERED FOR USE.

PESTICIDES USED IN THE PHILIPPINE BANANA INDUSTRY

No. 4 Fumazon (DBCP)

Country	Effective date	Description of action taken/grounds for decision
ARG	02 OCT. 1980	PROHIBITED FOR PRODUCTION, IMPORTATION, FORMULATION, COMMERCE AND USE. (REFERENCE: (ALEYE) ARGENTINIAN LEGISLATION, LEY, 22289...)
BEL	08 AUG. 1978	WITHDRAWN FROM THE MARKET.
CAN	1977	PRODUCT HAS BEEN DISCONTINUED.
COL	FEB. 1982	PROHIBITION OF IMPORT, MANUFACTURE AND SALE OF ALL PESTICIDES FOR AGRICULTURAL USE CONTAINING DBCP. THE MINISTRY OF HEALTH HAS CITED COMMUNITY HEALTH RISKS ASSOCIATED WITH THIS COMPOUND, INCLUDING CARCINOGENIC POTENTIAL AND STERILITY. (RNCOL)RESOLUTION, 243..08 FEB. 1982)
CYP	NOV. 1977	BANNED FOR AGRICULTURAL USE. REGISTRATION HAS BEEN WITHDRAWN BY THE PEST CONTROL PRODUCTS BOARD DUE TO THE POTENTIAL HEALTH RISK. THIS PRODUCT MAY CAUSE CANCER AND MALE STERILITY.
DDR		THIS SUBSTANCE IS NOT PERMITTED IN AGRICULTURAL CHEMICALS.
DNK		WITHDRAWN FROM USE AND NOT FORMULATED AS A PESTICIDE OR MANUFACTURED IN THE COUNTRY.
ECU	1986	REGISTRATION AND IMPORTATION OF DBCP ARE PROHIBITED BECAUSE THE SUBSTANCE IS HARMFUL TO HEALTH, AND ITS MANUFACTURE, MARKETING OR USE HAS BEEN PROHIBITED IN VARIOUS COUNTRIES. (RERERENCE: (ACMIN) ACUERDO MINISTERIAL NO. 0242.. 1985)
FIN	1978	WITHDRAWN FROM THE MARKET BY THE IMPORTER AT THE RECOMMENDATION OF AUTHORITIES. THIS DECISION WAS BASED ON THE KNOWN CARCINOGENIC RISKS OF THE SUBSTANCE.
STM	OCT. 1981	REGISTRATION OF THIS PRODUCT IS NOT PERMITTED.
IND		PESTICIDES BANNED FOR EXPORT.
ISR	1979	WITHDRAWN BY THE MANUFACTURER AND LICENSE CANCELLED. THIS COMPOUND POSES A DANGER OF STERILITY TO MALE EMPLOYEES DURING THE MANUFACTURING PROCESS. AND POSSIBLE DELETERIOUS EFFECTS AMONG APPLICATIONS OF THE FINISHED PRODUCT.
JPN	FEB. 1980	VOLUNTARILY WITHDRAWN BY THE MANUFACTURERS.
KEN		BANNED BY THE PEST CONTROL PRODUCTS BOARD.
NZL	1979	VOLUNTARILY WITHDRAWN FROM THE MARKET.
PAK		REGISTRATION WITHDRAWN DUE TO THE RISK OF CARCINOGENIC EFFECTS.
PHL		BANNED FOR USE AND/OR SALE.
SUN		PROHIBITED FOR USE.
SWE	22 AUG. 1978	THIS SUBSTANCE HAS BEEN BANNED BECAUSE IT CAN CAUSE DISTURBANCIES IN THE SPERMATOGENESIS. (RERERENCE: (PKS) PRODUKTKONTROLLNAEMNDENS BESLUT FRAAN DEN ... 22 AUG. 1978)
USA		ALL REGISTERED USES CANCELLED BY THE ENVIRONMENTAL PROTECTION AGENCY IN 1979. USE ON PINEAPPLES IN HAWAII WAS PERMITTED TO CONTINUE BUT ONLY UNDER SPECIFIED CONDITIONS. DBCP HAS BEEN FOUND TO BE A POTENTIAL CARCINOGEN AND MUTAGEN, AND A CAUSE OF STERILITY IN HUMANS. IN MARCH 1981 THE MANUFACTURER VOLUNTARILY CANCELLED ITS REGISTRATION EXCEPT FOR USE ON PINEAPPLES IN HAWAII. IN JANUARY 1985 A FEDERAL REGISTER NOTICE ANNOUNCING AN INTENT TO CANCEL THE USE OF DBCP IN HAWAII WAS PUBLISHED. (REFERENCE: (FEREAC) FEDERAL RESISTER. 50, 1122, 09 JAN. 1985)

No. 5 Penn cap M (parathion methyl)

Country	Effective date	Description of action taken/grounds for decision
ECU	1985	REGISTRATION IS PROHIBITED BECAUSE IT CAUSES ENVIRONMENTAL POLLUTION, PRODUCES TOXIC EFFECTS AND HAS BEEN BANNED IN VARIOUS COUNTRIES. (REFERENCE: (ACMIN) ACUERDO MINISTERIAL No. 0242... 1985)
MUN		MAY BE USED IN AGRICULTURE ONLY WHERE ITS PROPER APPLICATION IS ENSURED BY THE PRESENCE OF TRAINED STAFF AND PROTECTIVE EQUIPMENT.
JPN	JUNE 1971	BANNED FOR USE AS A PESTICIDE.

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No. 7 Difolatan (captafol)

Country	Effective date	Description of action taken/grounds for decision
DDR NOR		THIS SUBSTANCE IS NOT PERMITTED IN AGRICULTURAL CHEMICALS. REGISTRATION FOR THIS PRODUCT HAS BEEN WITHDRAWN SINCE THE AVAILABLE DATA WAS NOT CONSIDERED SUFFICIENT FOR REGISTRATION PURPOSES. RETAILERS ARE REQUIRED TO RETURN EXISTENT STOCKS TO THE IMPORTER.

No. 8 Dimecron (phosphamidon)

Country	Effective date	Description of action taken/grounds for decision
PHL		NOT REGISTERED FOR BANANA USE.
JPN		NOT REGISTERED FOR USE.

No. 9 Furan (carbofuran)

Country	Effective date	Description of action taken/grounds for decision
PHL		NOT REGISTERED FOR BANANA USE.
JPN		NOT REGISTERED FOR USE.

No. 12 Primicid (primiphos-ethyl)

Country	Effective date	Description of action taken/grounds for decision
JPN		NOT REGISTERED FOR USE.

No. 13 Supracide (methidathion)

Country	Effective date	Description of action taken/grounds for decision
PHL		CONSIDERED TOO HAZARDOUS FOR GENERAL USE. RESTRICTED TO INSTITUTIONAL USE ON BANANA PLANTATIONS ONLY.

No. 14 Gramoxone (paraquat)

Country	Effective date	Description of action taken/grounds for decision
FIN	30 AUG. 1986	USE BANNED BECAUSE OF HIGH ACUTE TOXICITY. (REFERENCE: (FIPBD) PESTICIDE BOARD... 24, APR. 1985)
HUN	1985	THE ACTIVE AGENT IS PERMITTED ONLY IF IT CONTAINS AN EMETIC AND IS COLOURED BLUE.
ISR	1963	DUE TO THE COMPOUND'S HIGH ACUTE MAMMALIAN TOXICITY, IT IS SUBJECT TO SPECIAL LABELING REQUIREMENTS, AND FORMULATIONS ARE REQUIRED TO CONTAIN AN EMETIC AND A DISTINGUISHING COLOR.
NOR	1981	THE PRODUCT HAS BEEN VOLUNTARILY WITHDRAWN FROM THE MARKET.
NZL	1983	UNDER THE TOXIC SUBSTANCES ACT, LIQUID PREPARATIONS AND SOLID PREPARATIONS CONTAINING 5% 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 "SUTABLE" EMETIC AND STENCHING AGENT MUST BE ADDED TO THIS PRODUCT.
PRT		MIXTURES OF PARAQUAT AND SIMAZINE MAY NOT BE MARKETED ON ACCOUNT OF ENVIRONMENTAL/TOXICOLOGICAL EFFECTS.(REFERENCE: (PORTP) COMISSAD DE TOXICOLOGIA DOS PESTICIDAS..)
SWE	31 DEC. 1983	BANNED BECAUSE OF ITS HIGH ACUTE TOXICITY AND IRREVERSIBLE EFFECTS. (REFERENCE: (PK8) PRODUKTKONTROLLNAEMNDENS BESLUT FRAAN DEN... 31 DEC. 1983)
PHL		CONSIDERED TOO HAZARDOUS FOR GENERAL USE. RESTRICTED TO INSTITUTIONAL USE ON BANANA PLANTATIONS ONLY.

PESTICIDES USED IN THE PHILIPPINE BANANA INDUSTRY

No. 16 Sumithaion 50 EC (fenitrothion)

Country	Effective date	Description of action taken/grounds for decision
PHL		NOT REGISTERED FOR BANANA USE.

No. 18 Heptachlor (heptachlor)

Country	Effective date	Description of action taken/grounds for decision
@EC	01 OCT. 1984	PROHIBITED FOR MARKETING AND USE. EXPORT ALLOWED WITH NO REQUIREMENT OF FOREIGN NOTIFICATION OF DOMESTIC RESTRICTIONS ON USE. (RERERENCE: (DJEC) OFFICIAL JOURNAL OF THE EUROPEAN COMMUNITIES, L91, 35, 1983)
ARG	01 JUNE 1972	PROHIBITED AS ANTI-WEEVIL AGENT IN TREATMENT OF SEEDS AND SEED PRODUCTS INTENDED FOR HUMAN AND ANIMAL CONSUMPTION. (REFERENCE: (ADISS) ARGENTINIAN LEGISLATION, DISPOSICION, 47...)
ARG	21 FEB. 1968	PROHIBITED AS TUCURICIDE (GLOW-WORM KILLER). (REFERENCE: (ADECA) ARGENTINIAN LEGISLATION, DECRETO, 649..)
ARG	01 MAY 1968	PROHIBITED AS EXTERNAL PARASITICIDE. (RERERENCE: (ADECA) ARGENTINIAN LEGISLATION, DECRETO, 2143..)
ARG	10 JUNE 1969	PROHIBITED IN TREATMENT OF NATURAL AND ARTIFICIAL MEADOWS, IN ANIMAL FEED AND AS EXTERNAL PARASITICIDE. (RERERENCE: (ADECG) ARGENTINIAN LEGISLATION, DECRETO, 2678..)
ARG	20 DEC. 1971	PROHIBITED IN CULTIVATION, COMMERCE AND INDUSTRIAL USE OF TOBACCO. (REFERENCE: (ADISS) ARGENTINIAN LEGISLATION, DESPOSICION, 80..)
AUT	1976	CLASSIFIED AS A "HIGHLY TOXIC POISON". IT MAY BE MANUFACTURED, BOUGHT OR SOLD ONLY WITH A SPECIAL LICENSE AND IS SUBJECT TO CERTAIN PACKAGING AND LABELLING REQUIREMENTS.
BEL		THE USE OF HEPTACHLOR IS PROHIBITED ACCORDING TO EEC DIRECTIVE 79/117.
CAN	1970	MOST FOOD USES FOR THIS PRODUCT WERE PHASED OUT IN 1970 DUE TO PERSISTENCE AND BIOACCUMULATION OF RESIDUES. MOST ADDITIONAL USES DISCONTINUED IN 1976. MINOR USE ON FLOWER BULBS REMAINS.
CHE	1972	USE OF THIS SUBSTANCE IS PROHIBITED IN PRODUCTS FOR PUBLIC USE (SUBSTANCES INTENDED FOR PRIVATE AND COMMERCIAL USE) AND IN COMMERCIAL PRODUCTS (SUBSTANCES INTENDED FOR USE IN TRADE AND INDUSTRY). (REFERENCE: (RSCH) RECEUIL SYSTEMATIQUE DU DROIT FEDERAL, 814.839.. 1985)
CHL	05 JAN. 1983	APPLICATION OF THE PRODUCT TO NATURAL OR ARTIFICIAL MEALS USED DIRECTLY OR IN CONCENTRATED FORM AS ANIMAL FEED IS PROHIBITED. ITS USE IS PROHIBITED ON SEEDS, GRAIN ETC. THIS MEASURE WAS TAKEN TO PROTECT PUBLIC HEALTH AND THE ENVIRONMENT. DECISION OF THE MINISTRY OF AGRICULTURE 4. (REFERENCE: (MINSC) MINISTERIO DE SALUD..1983)
CYP		NOT SUBMITTED FOR REGISTRATION. ACCORDING TO THE DECISIONS OF THE PEST CONTROL PRODUCTS BOARD THIS CHEMICAL WILL NOT BE PERMITTED FOR ANY USE DUE TO HEALTH RISKS AND ENVIRONMENTAL HAZARDS.
DDR		THIS SUBSTANCE IS NOT PERMITTED IN AGRICULTURAL CHEMICALS.
DEU	1980	PROHIBITED FOR USE AS PLANT PROTECTANT. (REFERENCE: (BGBL) BUNDESGESETZBLATT. IS, 2335, 1980)
DNK		BANNED IN ACCORDANCE WITH EEC-DIRECTIVE 79/117.
ECU		REGISTRATION AND IMPORTATION OF HEPTACHLOR ARE PROHIBITED BECAUSE THE SUBSTANCE IS HARMFUL TO HEALTH, AND ITS MANUFACTURE, MARKETING OR USE HAS BEEN PROHIBITED IN VARIOUS COUNTRIES. (REFERENCE: (ACMIN) ACUERDO MINISTERIAL No. 0242... 1985)
ISR	1958	APPROVED FOR USE ONLY IN THE TREATMENT OF SOIL, DUE TO PROBLEMS OF ENVIRONMENTAL PERSISTENCE.
NZL		VOLUNTARILY WITHDRAWN FROM THE MARKET.
PHL	1982	<u>ONLY ALLOWED USE IN AGRICULTURE IS FOR PINEAPPLE PLANATIONS UNDER CERTAIN CONDITIONS. ONLY OTHER ALLOWED USE IS FOR TERMITE CONTROL ONLY. PROHIBITED FOR IMPORT EXCEPT IN CASES OF EMERGENCY AS DETERMINED BY THE AUTHORITIES.</u>
PRT	01 JAN. 1974	PESTICIDES BASED ON THIS PRODUCT HAVE BEEN BANNED ON ACCOUNT OF THEIR TOXICOLOGICAL/ENVIRONMENTAL EFFECT. (REFERENCE: (PORTP) COMISSAD DE TOXICOLOGIA DOS PESTICIDAS.. 21 FEB. 1973)
SGP	APR. 1984	IMPORTATION AND SALE FOR LOCAL USE IS BANNED. THIS DECISION WAS TAKEN TO SAFEGUARD WATER SOURCES. (REFERENCE: (MINHS) MINISTRY OF HEALTH... 1983)
SUN		USED ONLY AS INSECTICIDE FOR STERILIZATION PROCESSES.
TUR		BANNED FOR USE AND/OR SALE DUE TO HEALTH RISKS AND ENVIRONMENTAL IMPACT.

(Continued)

Country	Effective date	Description of action taken/grounds for decision
USA	MAR. 1978	THE ENVIRONMENTAL PROTECTION AGENCY HAS CANCELLED ALL USES EXCEPT THE FOLLOWING: (1) SUBSURFACE GROUND INSERTION FOR TERMITE CONTROL (CLARIFIED BY FEREAC, 40, 30522, TO APPLY TO THE USE OF EMULSIFIABLE OR OIL CONCENTRATE FORMULATIONS FOR CONTROLLING SUBTERRANEAN TERMITES ON STRUCTURAL SITES SUCH AS BUILDINGS, HOUSES, BARNs AND SHEDS, USING CURRENT CONTROL PRACTICES); (2) DIPPING OF ROOTS OR TOPS OF NONFOOD PLANTS. HEPTACHLOR HAS BEEN DEEMED TO PRESENT AN UNREASONABLE RISK TO HUMANS BY VIRTUE OF ITS TOXICITY TO NON-TARGET ORGANISMS, SUCH AS BIRDS, FINDINGS OF AN INCREASED INCIDENCE OF LIVER CANCER IN MICE EXPOSED TO THE COMPOUND, AND ITS ENVIRONMENTAL CONTAMINATION AND PERSISTENCE IN MAMMALIAN TISSUES. THE EPA HAS CITED THE AVAILABILITY OF ALTERNATIVE AND SAFER PESTICIDES. (REFERENCE: (FEREAC) FEDERAL REGISTER, 43, 12372, 1978)
VEN	1983	THE PREPARATION, IMPORT, EXPORT, STORAGE, PURCHASE, SALE AND DISTRIBUTION OF ORGANOCHLORINE INSECTICIDES SHALL BE PERMITTED ONLY WHEN THEY ARE INTENDED FOR THE CONTROL OF VECTORS FOR MEDICAL REASONS, AND CONTROL OF AGRICULTURAL PESTS. PROVIDED THAT THEIR APPLICATION IS SUPERVISED BY THE COMPETENT AUTHORITIES. 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. (REFERENCE: (GOVEN) GACETA OFICIAL DE LA REPUBLICA DE VENEZUELA, 247,720. 1983)
YUG	1972	THESE PREPARATIONS WERE BANNED FROM CIRCULATION AND USE IN AGRICULTURE. THE BAN WAS IMPOSED BECAUSE OF ITS HIGH PERSISTENCE AND NOXIOUS EFFECT ON HUMAN HEALTH AND THE ENVIRONMENT. IN 1982, HEPTACHLOR WAS PROHIBITED FOR ANY USE WHATSOEVER.

No. 20 Lindane ( $\gamma$  BHC)

Country	Effective date	Description of action taken/grounds for decision
ARG	20 DEC. 1971	PROHIBITED IN CULTIVATION, COMMERCE AND INDUSTRIAL PROCESSING OF TOBACCO. (REFERENCE: (ADISS) ARGENTINIAN LEGISLATION, DISPOSICION, 80..)
ARG	01 JUNE 1972	PROHIBITED AS ANTI-WEEVIL AGENT IN TREATMENT OF SEEDS AND SEED PRODUCTS INTENDED FOR HUMAN AND ANIMAL CONSUMPTION. (REFERENCE: (ADISS) ARGENTINIAN LEGISLATION, DISPOSICION, 47..)
BEL		AGRICULTURAL USE RESTRICTED TO TREATMENT OF GROUND OR SEEDS TO COMBAT GROUND INSECTS.
BGR		BANNED FOR USE IN AGRICULTURE.
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 A LIMITED NUMBER OF CROPS. AND FOR CERTAIN LIVESTOCK AND STRUCTURAL USES.
COL	MAY 1978	PROHIBITION OF USE AND SALE OF ORGANOCHLORINE-CONTAINING INSECTICIDES IN THE CULTIVATION OF COFFEE, EITHER SINGLY OR IN COMBINATION. THIS RESTRICTION IS BASED ON STANDARDS SET BY COUNTRIES IMPORTING THESE AGRICULTURAL PRODUCTS. (REFERENCE: (RNCOL) RESOLUTION, 209..12 MAY 1978)
CYP	DEC. 1980	RESTRICTED TO USE ONLY IN THE TREATMENT OF LEGUME SEEDS FOR SOWING PURPOSES (DUST FORMULATIONS CONTAINING PIGMENT AND 1-3% ACTIVE INGREDIENT) AND FOR TERMITE CONTROL IN NON-AGRICULTURAL LAND.
DEU	01 JAN. 1981	PROHIBITED FOR USE AGAINST PARASITES ON LACTATING HORSES, COWS, SHEEP AND GOATS WHICH ARE USED FOR MILK PRODUCTION. (REFERENCE: (BGBL) BUNDESGESETZBLATT, IS, 1136, 1981)
DEU	01 OCT. 1980	MAY NOT BE USED IN ANTI-FOULING PAINTS EXCEPT WHEN NO SUBSTITUTE IS AVAILABLE AND PERMISSION IS GIVEN BY THE APPROPRIATE AUTHORITY. (REFERENCE: (BGBL) BUNDESGESETZBLATT, IS, 2069, 1980)
ECU	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. (REFERENCE: (ACMIN) ACUERDO MINISTERIAL No. 0242... 1985)
FIN		THE SUBSTANCE IS SUBJECT TO SEVERE RESTRICTIONS SET BY THE PLANT PROTECTION AGENCY. USE IS ALLOWED ONLY IN A FEW SPECIFIC CASES.

(Continued)

PESTICIDES USED IN THE PHILIPPINE BANANA INDUSTRY

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 PESTICIDES HAVE BEEN BANNED OR SEVERELY RESTRICTED SINCE 1968.
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.
JPN	DEC. 1971	BANNED FOR SALE AS A PESTICIDE.
NZL	1983	UNDER THE PROVISIONS OF THE TOXIC SUBSTANCES ACT, LIQUID FORMULATIONS OF THIS PRODUCT ARE AVAILABLE TO COMMERCIAL 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.
PHL	1983	<u>PROHIBITED FOR IMPORT EXCEPT IN CASES OF EMERGENCY AS DETERMINED BY THE AUTHORITIES AND IN CASES OF DIRECT IMPORTATION OF SUGAR PLANTATIONS.</u>
SGP	APR. 1984	IMPORTATION AND SALE FOR LOCAL USE IS BANNED. THIS DECISION WAS TAKEN TO SAFEGUARD WATER SOURCES. (REFERENCE: (MINHS) MINISTRY OF HEALTH... 1983)
SUN		NOT USED IN CATTLE INDUSTRY.
USA		CANCELLATION OF LINDANE-CONTAINING PRODUCTS FOR USE IN VAPORIZERS OR FOR INDOOR USE IN SMOKE FUMIGATION DEVICES. CANCELLATION OF REGISTRATIONS AND DENIAL OF APPLICATIONS FOR REGISTRATION OF LINDANE-CONTAINING PRODUCTS FOR ALL OTHER USES UNLESS LABELS CONTAIN GIVEN STATEMENTS FOR EACH USE. (SEE ALSO: PR NOTICE 69-9 (1969), IF & R DOCKET No. 19, FR 49,26282 (1984)). (REFERENCE: (FEREAC) FEDERAL REGISTER, 49, 48512, 1983)
YUG	1972	IT WAS EXCLUDED FROM USE IN AGRICULTURAL PRODUCE STORAGE, ON VEGETABLES, TOBACCO, FORAGE PLANTS, GRAPEVINES, MEDICINAL HERBS IN GLASS-HOUSES AND PLASTIC HOUSES. IN ADDITION, THE FOLLOWING CANNOT BE GROWN ON TREATED AREAS 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 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; IT ADVERSELY AFFECTS THE BIOGENOSIS.

No. 21 Basudin (diazinon)

Country	Effective date	Description of action taken/grounds for decision
PHL		<u>NOT REGISTERED FOR BANANA USE.</u>

No. 22 Malathion (malathion)

Country	Effective date	Description of action taken/grounds for decision
PHL		<u>NOT REGISTERED FOR BANANA USE.</u>
IND		BANNED.

No. 24 Orthene 400 (acephate)

Country	Effective date	Description of action taken/grounds for decision
PHL		<u>NOT REGISTERED FOR BANANA USE.</u>

## No. 26 Benlate (benomyl)

Country	Effective date	Description of action taken/grounds for decision
FIN		WITHDRAWN FROM THE MARKET BY THE LICENSEE. THE PLANT PROTECTION INSTITUTE OF THE NATIONAL BOARD OF HEALTH HAS CITED CARCINOGENIC HAZARDS ASSOCIATED WITH ITS USE.

## No. 34 Decis

Country	Effective date	Description of action taken/grounds for decision
JPN		NOT REGISTERED FOR USE.

## No. 35 Topsin M (thiophanate-methyl)

Country	Effective date	Description of action taken/grounds for decision
FIN	1976	RESTRICTED FOR USE ON THE BASIS OF A STATEMENT ISSUED BY THE NATIONAL BOARD OF HEALTH CONCERNING THE TOXICOLOGICAL QUALITIES OF THE COMPOUND AND THE FACT THAT IT IS A CARCINOGENIC METABOLITE.

## No. 36 Alum (aluminium phosphide)

Country	Effective date	Description of action taken/grounds for decision
BEL	1976	USE RESTRICTED TO SPECIALLY AUTHORIZED USERS WITH ADEQUATE EQUIPMENT FOR THE APPLICATION OF THE PRODUCT AND IN POSSESSION OF WARE-HOUSES EXCLUSIVELY RESERVED TO STOCKING TOXIC PRODUCTS.

## No. 37 Formalin (formaldehyde)

Country	Effective date	Description of action taken/grounds for decision
JPN	1975	RESTRICTED FOR USE.

## No. 42 Methyl Bromide (methyl bromide)

Country	Effective date	Description of action taken/grounds for decision
PHL		<u>ONLY BY CERTIFIED FUMIGATORS, ADEQUATE TIME FOR AERATION IS REQUIRED BEFORE COMMODITIES ARE PROCESSED INTO FOOD OR FEED.</u>

# PESTICIDES USED IN THE PHILIPPINE BANANA INDUSTRY

Note:

## \*LIST OF CODES USED FOR COUNTRIES, TERRITORIES AND AREAS

ARE	United Arab Emirates	KOR	Korea Republic of
ARG	Argentina	KWT	Kuwait
AUS	Australia	LUX	Luxembourg
AUT	Austria	MAR	Morocco
BEL	Belgium	MEX	Mexico
BGD	Bangladesh	MLT	Malta
BGR	Bulgaria	MUS	Mauritius
BRA	Brazil	MYS	Malaysia
BRB	Barbados	NGA	Nigeria
CAN	Canada	NLD	Netherlands
CHE	Switzerland	NOR	Norway
CHL	Chile	NPL	Nepal
COG	Congo	NZL	New Zealand
COL	Colombia	OMN	Oman
CRI	Costa Rica	PAK	Pakistan
CSK	Czechoslovakia	PER	Peru
CUB	Cuba	PHL	Philippines
CYP	Cyprus	POL	Poland
DDR	German Democratic Republic	PRT	Portugal
DEU	Germany, Fed Rep of	ROM	Romania
DNK	Denmark	RWA	Rwanda
DOM	Dominican Rep	SAU	Saudi Arabia
ECU	Ecuador	SGP	Singapore
EGY	Egypt	SUN	Union of Soviet Socialist Republics
ESP	Spain	SUR	Suriname
FIN	Finland	SWE	Sweden
FRA	France	TCO	Chad
GBR	United Kingdom	TGO	Togo
GRC	Greece	THA	Thailand
GTM	Guatemala	TUN	Tunisia
HND	Honduras	TUR	Turkey
HUN	Hungary	TWN	Taiwan Province (China)
IDN	Indonesia	USA	United States
IND	India	VEN	Venezuela
IRL	Ireland	YEM	Yemen
IRAN	Iran	YUG	Yugoslavia
ISR	Israel	ZAF	South Africa
ITA	Italy	ZMB	Zambia
JOR	Jordan	ZWE	Zimbabwe
JPN	Japan	@EC	European Community
KEN	Kenya	@WD	World

## CHAPTER 2      **DBCP POISONING ON STANDARD FRUIT BANANA PLANTATIONS IN COSTA RICA**

In Chapter 1 we showed that the banned chemical, DBCP (Fumazon) is still used on Philippine banana plantations. It is very urgent to stop the use of this chemical when we see the tragedy of banana workers in Costa Rica.\*<sup>1</sup>

The tragedy happened on the banana plantations run by Standard Fruit (owned, in turn, by Castle & Cooke, Inc., one of the world's largest food-production conglomerates). One of Castle & Cooke's biggest pest problems at its banana plantation is the nematode. Luckily for banana growers, two of the world's largest chemical companies-Dow Chemical and Shell Oil-had come up with a chemical, dibromochloropropane, DBCP, to combat nematodes. In the late 1950's, separate scientific studies sponsored by the two manufacturers revealed that DBCP damaged the testicles and reduced the sperm count of laboratory animals. But over the subsequent 20 years neither company included this information on its product labels. Government officials aware of the results approved the DBCP labels despite these findings.

At Rio Frio and at Standard Fruit's other big plantations in the remote Valle de la Estrella (Valley of the Star), plantation workers say they were instructed to mix DBCP with water and pour it into canisters called pichingas for transportation to the field. Then they filled their injectors, which resembled mammoth hypodermic needles, and injected DBCP into the soil around the base of the banana plants.

In the summer of 1977, while the workers in Costa Rica's banana plantations were applying DBCP, the wives of chemical manufacturing plant in California discovered during conversations in the bleachers while their husbands played baseball that they all shared a problem; none of them was able to get pregnant. Later it was reported that DBCP had made dozens of chemical workers sterile at plants across the country. Dow and Shell immediately suspended all production, and the Environmental Protection Agency of the USA (EPA) initiated its regulatory process to cancel the chemical's registration.

However Castle & Cooke worried that a ban on DBCP would drastically reduce banana yields, and emphasized that "there is no evidence that people who apply the chemical, as opposed to those who manufacture it, have been rendered sterile or have been harmed in other ways." Thus Castle & Cooke decided that it would continue using DBCP until it was banned in the company's areas of operation.

On the other hand in Costa Rica, a physician in San Jose had more banana workers coming to him because they couldn't have children. In late November, 1978 -a year after workers in California discovered they were sterile-the physician met with Costa Rican officials to present his evidence. By December, Standard Fruit, under pressure from the Government, agreed to stop using DBCP in Costa Rica. According to the Costa Rican government's chief consulting urologist, Carlos Calvosa Alegretti, as little as one hundred hours of exposure to DBCP can cause sterility, and he says over one thousand workers in Costa Rica alone may have become permanently sterile as a result of exposure to it (San Jose attorney Marlene Chavez believes the total is closer to three thousand).

By late 1979, DBCP was banned in the Continental United States. However it was not illegal to continue sending the banned chemical overseas (nor is it today). As late as 1980, three years after the sterility link had surfaced in California and two years after the first cases showed up in Costa Rica, Castle & Cooke was still using DBCP in an unidentified "Third World country." Other

corporate and government documents indicate that once the chemical could not longer be used in Costa Rica, which has one of Central America's most democratic governments, the banana company simply shipped its remaining stocks out of the country. The records document that the DBCP was sent to Honduras, a military state where no one was likely to raise a public protest.

In Costa Rica about 400 workers have received compensation from the Costa Rica national insurance agency for DBCP poisoning, in amounts ranging between \$300 and \$4000. Many have not been satisfied with their compensation. In 1986, they contacted U.S. lawyers from the Texas firm, Baron & Budd to prepare a case against Dow and Shell. They have filed claims for 125 people in Texas courts, hoping that culpable companies will be forced to award workers for higher amounts for this tragic disorder in the U.S. as workers in a DBCP plant in California were awarded compensation over £1 million each in some cases.

Castle & Cooke says that market surveys show that consumers won't buy fruit if it looks scarred or slightly damaged. Cathleen McInerney Barnes of EPA counters: "It's easy to blame the consumer, but when is the consumer ever asked whether he or she would prefer fruit, or fewer poisonings in the Third World? I'm not sure they would choose to pay that price."

### CHAPTER 3      ALTERNATIVE PEST CONTROL

We introduce a few successful examples of alternative pest control in this chapter.

#### (1) United Fruit Company's Banana Plantations in Costa Rica<sup>\*1</sup>

American scientist Michael Hansen explains in his recent book Escape from the Pesticide Treadmill: Alternatives to Pesticides in Developing Countries<sup>1</sup> how a banana company in Costa Rica succeeded in pest control without the use of chemical pesticides.

In an effort to control the two economically important pests, the banana corm weevil and a species of thrips, the United Fruit Company undertook an intensive campaign of insecticide use. However, within a couple of months of the mass aerial application of dieldrin, there was an outbreak of the banana stalk borer, a moth larva that previously had not been a problem. Another lepidopteran (butterflies and moths) pest, which feeds between adjacent fingers, also suddenly appeared and caused great losses.

United Fruit responded to these outbreaks by spraying more insecticides. By 1958, pest problems had become very serious. Although increasing amounts of pesticides were being used, that year brought an unprecedented outbreak of pests, including seven major butterfly and moth pests that had not previously been a problem.

In the late 1950's the pests became resistant to dieldrin. In 1959, United Fruit hired four more entomologists to study the pest outbreaks in Costa Rica and elsewhere. In general, these entomologists demonstrated that many natural control agents existed in the area but were constantly being suppressed by pesticide application. Thus, predators and parasitoids were rare in banana plantations, although they remained abundant in the marginal areas between plantations and the forest.

During the mid-1960's the company's entomologists made some other promising discoveries. In particular, they demonstrated that the banana plant could tolerate much more insect damage, without harming the fruit or reducing yields, than was traditionally believed. Yet, in spite of this information,

company officials still relied on insecticide sprays all through the 1960's, according to Dr. Clyde Stephens, an entomologist who served as the experimental director for the Banana Company of Costa Rica in Golfito, Costa Rica, a subsidiary of United Fruit. However, by the early 1970's, the entomologists had gotten United Fruit to hold off on spraying until a new, higher "threshold level" of caterpillars was reached. The result was that the number of applications declined.

Then, in 1973, United Fruit decided to take a bold step: stop all insecticide sprays in the entire Golfito banana division. The entomologists predicted that with pesticide sprays stopped, natural enemies again would become abundant and re-exert a natural control over many of the pest populations.

Fortunately, the results proved them correct: insect pests dropped to below economic threshold within one to three generations (a period of several months) with little or no fruit loss. Within two years, virtually all the previous pest species had almost disappeared. There were occasional small outbreaks of larvae of two lepidoptera, but their numbers always remained below the economic threshold, as did those of the weevil. The red rust thrip remained a problem but the company discovered it could prevent damage by putting plastic bags on the fruits.

## (2) Integrated Pest Control in Indonesia<sup>2</sup>

The third PAN<sup>2</sup> international meeting was held in Penang, Malaysia, 25 ~ 28 January 1989, where there was a report on a successful example of Integrated Pest Control (IPC) in Indonesia.

In an effort to control a pest species the Indonesian government offered financial assistance to farmers in purchasing imported pesticides, but it did not bring any good result. The assistance programme only brought about a financial difficulty. In 1986 the government decided to invite IPC experts of the Food and Agricultural Organization (FAO) to the country and make an experimental application of IPC, using natural control agents (spiders, praying mantes, etc.). For this experiment, the government either banned or regulated the utilization of pesticides. The result was a successful control of the pest species and a 16% increase of agricultural production. At the same time the pesticide consumption in the country reduced considerably from 14,200 tons in 1986 to 5,800 tons in 1987. The success helped the government's financial condition by saving foreign exchange reserves and reducing the amount of financial assistance to farmers. Moreover, the success led to the ban of 57 pesticides in 1988 and also the total abolition of the financial assistance programme in 1989.

The government is now planning on providing 2,500,000 farmers with IPC training by the year 1994. An IPC expert of FAO is to apply IPC in the Philippines where he originally developed his techniques.

## **CHAPTER 4 ADMINISTRATIVE MEASURES TAKEN BY THE PHILIPPINE GOVERNMENT TO CONTROL PESTICIDE USE**

### (1) The 1984 Study Commissioned by the Labor Ministry and Conducted by UP Los Banos Prof. Edwin D. Magallona on Pesticide Poisoning, Especially in the Export Banana Industry<sup>1</sup>

The study was a part of the Labor Ministry's effort to update itself on working conditions of laborers in the agricultural and industrial sectors.

The study pointed out the following two factors which necessitated the wide use of pesticides. One is the cropping system called "monoculture" and the other is strict quality standards imposed on the nation's agricultural export crops like bananas.

The study also pointed out that 80% of herbicides, 90% of fungicides and 59% of fumigants are bought by the export banana sector alone and that the banana industry has been allowed by FPA to use more hazardous pesticides like paraquat, Mocap, Namacur and Furadan which are not made available to ordinary farmers.

The study noted that the aircraft application is the most hazardous due to the consequence of drift.

As to the remedies for the situation, the study called for a sustained information campaign to educate people in the countryside on the dangers posed by pesticides to their health. It urged that the efforts be a combined undertaking of the Ministries of Labor, Health and Agriculture and the National Crop Protection Center.

Aside from the information drive, the study recommended that the government impose limits on aerial spraying of pesticides, make the wearing of protective clothing and other gear mandatory (though wearing of such gear is usually ignored by those applying the insecticides because they are uncomfortable and also because of laxity on part of employers who hire people to do the spraying of the chemicals), and research on other protective measures and limiting plantation workers' exposure to the pesticides through a rotation system.

Now we see that the concerned government agencies are fully aware of the pesticide problem on banana plantations. Yet, these recommendations are not being fully implemented. The photo No.1 illustrates the fact.

## (2) FPA's New Color-Coding System<sup>2</sup>

On July 21, 1985, FPA announced that it would adopt the color-coding system recommended by the World Health Organization (WHO). Under the system, pesticide would be classified into four levels of toxicity, with each level being assigned a color. The four colors were red, yellow, blue and green. The most toxic pesticide would be coded red, while the least toxic would be coded green.

With the new color-coding system, even those users who didn't or couldn't read the labels would at least be alerted on the level of toxicity of the sprout they were using.

However, this color-coding system is not working at least on the banana plantations we investigated as management classifies pesticide related information as confidential. Usually chemicals are repacked in containers which do not have labels, thus end users do not receive any warning or caution. Furthermore, pesticide applicators are not provided protective gear by the company and the new system is not quite helpful for banana plantation workers (see photo No.1).

## (3) The 1986 Study on Pesticide Effects by a Joint Team<sup>3</sup>

A joint team of doctors from the Ministry of Health and the Philippine Pesticides Authority was dispatched to Southern Mindanao to check reports that some banana plantation workers are suffering from diseases caused by the use of pesticides.

This dispatch of the team took place after the Philippine Banana Anti-Pesticide Campaign was launched in Japan. The campaign demanded the Philippine government take necessary measures to help banana plantation workers suffering from pesticide related diseases.

In spite of this effort by the government we saw a death caused by pesticides in General Santos

City in October, 1988. About 300 workers joined the funeral march for Jesus Solitana in General Santos City. He was working in a banana plantation in that city.

These three examples show that repeated administrative effort for pesticide control has not resulted in the effective prevention of pesticide poisoning. It is necessary to find out disturbing factors promptly.

**NOTE:****INTRODUCTION**

(1) ICL Research Team, The Human Cost of Bananas, Manila, 1979; David, R. et al., Transnational Corporations and the Philippine Banana Export Industry, Report to UN CTC/ESCAP Unit on Corporations by Third World Studies Center, University of the Philippines, Quezon City, 1981; Javellana, N.T., A Qualitative Analysis of The Process Whereby A Group of Farmer-Settlers Turned Lessors To A Banana Company In La Libertad, Sto. Tomas, Davao Del Norte, M.Sc. Thesis, Asian Social Institute, Manila, 1981; CORPORATIONS IN THE PHILIPPINE BANANA EXPORT INDUSTRY: A PRELIMINARY ACCOUNT BY PETER KRINKS The Philippines In The Third World Papers Series No.28, THIRD WORLD STUDIES College of Arts and Science, University of the Philippines, Quezon City, December 1981; David, R.S. et al., Political Economy of Philippine Commodities, THIRD WORLD STUDIES PROGRAM, Third World Studies Center, Quezon City, 1983; Eduardo Tadem, Johnny Reyes, Linda Susan Magno, Showcases of Under-development in Mindanao: fishes, forest and fruits, published by Alternative Resources Center in cooperation with Forum for Approaches in Research, Media and Development, Davao City, 1984; Edited by The Japan Council for Philippine Concerns, Philippine Bananas and the Japanese, Tokyo, March 1981; Tsurumi, Yoshiyuki, Bananas and the Japanese — Between Plantations and Our Tables —, Iwanami, Tokyo, 1982; Ohtsu, Kazuko, From A Banana, Kokudoshu, Tokyo, November 1987; Takigami, Shinobu et al., Farming in the Tropics — Testimonies — With the 21st Century in Perspective —, Kokinshoin, Tokyo, April 1987; Nakamura, Yoko et al., From Bananas Toward Human Rights — Japanese Citizens' Movement About the Philippine Banana Issue —, Dohbunkan, Tokyo, May 1988.

(2) The Japan Council for Philippine Concerns, op cit.; Tsurumi Y., op cit.; Nakamura Y., op cit.

(3) Farmers Assistance Board, profits from poison — a look into the socio-economics and politics of pesticides, Quezon City, 1982; Edwin D. Magalona, Pesticide Use in The Banana and Sugar Industries, "Philippine Labor Review" January-July, 1984 Vol. 8 No.1; HEALTH & WORKERS GROUP, Council for Primary Health Care, Inc., 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, Manila, 1985; Edited by The Western Japan Occupational Health & Safety Study Group, Health and Medical Service, Pollution and Occupational Health and Safety in the Philippines, Amagasaki, September 1986.

**CHAPTER 1**

(1) The tables in this chapter were made on the basis of the information available from the following researches and the field surveys by the author.

Shibuya, S, Index of Pesticides (2nd Edition), October 1980; Farmers Assistance Board, Inc., op cit., Fertilizer And Pesticide Authority, BANNED AND RESTRICTED PESTICIDES IN THE PHILIPPINES, October 1984, Fertilizer and Pesticide Authority of the Philippines, REGISTERED AGRICULTURAL RESTICIDE ES — 11 — 30 — 86, May 1985; HEALTH & WORKERS GROUP, Council for Primary Health Care, Inc., op cit.; CONSOLIDATED LIST OF

PRODUCTS WHOSE CONSUMPTION AND/OR SALE HAVE BEEN BANNED, WITHDRAWN, SEVERELY RESTRICTED OR NOT APPROVED BY GOVERNMENTS  
SECOND ISSUE Prepared in accordance with General Assembly resolutions 37/137, 38/149 and 39/229, New York, 1987; Division of Vector Biology And Control, WHO THE WHO RECOMMENDED CLASSIFICATION OF PESTICIDES BY HAZARD and GUIDELINES TO CLASSIFICATION 1988 ~ 1989, Geneva, 1988; Uemura, Shinsaku et al., Dictionary of Toxicity of Pesticides, Sanseido, 1988; NATIONAL WILDLIFE FEDERATION, 34 PESTICIDES: IS SAFE USE POSSIBLE? A Handbook of Pesticides Regulated in the United States Including Official: Use Precautions First Aid Reasons for Regulatory Status, Washington; the ARSAP Agro-pesticide Project, ESCAP Agricultural Division, the ARSAP Agro-pesticide Index, Bangkok. Consumer Current, IOCU Penang

(2) Weir, David and Schapiro, Mark, Circle of Poison: Pesticides and People in a Hungry World, Institute for Food and Development Policy, San Francisco, 1981.

## CHAPTER 2

(1) Weir, David and Matthiessen, Constance, Will the Circle Be Unbroken?, "The New Mother Jones," June 1989.

## CHAPTER 3

(1) Hansen, Michael, Ph.D., Escape from the pesticide treadmill: ALTERNATIVES TO PESTICIDES IN DEVELOPING COUNTRIES, Institute for Consumer Policy Research Consumers Union, New York, 1988.

(2) The Pesticide Action Network (PAN) was launched in March, 1982, in Malaysia at the international conference organized by the International Organization of Consumers Unions and the Friends of the Earth, Malaysia.

## CHAPTER 4

(1) METRO MANILA TIMES April 5, 1984

(2) The Mindanao MIRROR BULLETIN July 22 — 25, 1985

(3) Malaya July 29, 1986