OPERATION OF THE PRIOR INFORMED
CONSENT PROCEDURE FOR BANNED
OR SEVERELY RESTRICTED CHEMICALS
IN INTERNATIONAL TRADE

DECISION GUIDANCE DOCUMENTS

Captafol

JOINT FAO/UNEP PROGRAMME
FOR THE OPERATION OF
PRIOR INFORMED CONSENT

United Nations Environment Programme

UNEP

Food and Agriculture Organization
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Food and Agriculture Organization of the United Nations
United Nations Environment Programme
Rome - Geneva 1991; amended 1996

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The inclusion of these chemicals in the Prior Informed Consent Procedure is based on reports of control action submitted to the United Nations Environment Programme (UNEP) by participating countries, and which are presently listed in the UNEP-International Register of Potentially Toxic Chemicals (IRPTC) database on Prior Informed Consent. While recognizing that these reports from countries are subject to confirmation, the FAO/UNEP Joint Working Group of Experts on Prior Informed Consent has recommended that these chemicals be included in the Procedure. The status of these chemicals will be reconsidered on the basis of such new notifications as may be made by participating countries from time to time.

The use of trade names in this document is primarily intended to facilitate the correct identification of the chemical. It is not intended to imply approval or disapproval of any particular company. As it is not possible to include all trade names presently in use, only a number of commonly used and published trade names have been included here.

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ABBREVIATIONS WHICH MAY BE USED IN THIS DOCUMENT

(N.B. : chemical elements and pesticides are not included in this list)

ADI	acceptable daily intake
ai	active ingredient
b.p.	boiling point
bw	body weight
^{o}C	degree Celsius (centigrade)
CCPR	Codex Committee on Pesticide Residues
DNA	Designated National Authority
EC	emulsion concentrate
EEC	European Economic Community
EPA	U.S. Environmental Protection Agency
ERL	extraneous residue limit
FAO	Food and Agriculture Organization of the United Nations
g	gram
μg	microgram
GAP	good agricultural practice
GL	guideline level
ha	hectare
IARC	International Agency for Research on Cancer
i.m.	intramuscular
i.p.	intraperitoneal
IPCS	International Programme on Chemical Safety
IRPTC	International Register of Potentially Toxic Chemicals
JMPR	Joint FAO/WHO Meeting on Pesticide Residues (Joint Meeting of the FAO Panel of Experts on Pesticide Residues in Food and the Environment and a WHO Expert Group on Pesticide Residues)
k	kilo- (x 103)
kg	kilogram
l	litre
LC_{50}	lethal concentration, 50%
LD_{50}	lethal dose, median

m	metre
mg	milligram
ml	millilitre
m.p.	melting point
MRL	Maximum Residue Limit.
MTD	maximum tolerated dose
ng	nanogram
NOEL	no-observed-effect level
NOAEL	no-observed-adverse-effect level
NS	Not Stated
OP	organophosphorus pesticide
PHI	pre-harvest interval
ppb	parts per billion
ppm	parts per million (Used only in reference to the concentration of a pesticide in an experimental diet. In all other contexts the terms mg/kg or mg/l are used).
ppt	parts per trillion
sp gr	specific gravity
STEL	Short Term Exposure Limit
TADI	Temporary Acceptable Daily Intake
TLV	Threshold Limit Value
TMDI	theoretical maximum daily intake
TMRL	Temporary Maximum Residue Limit
TWA	Time Weighted Average
UNEP	United Nations Environment Programme
WHO	World Health Organization
WP	wettable powder
wt	weight
<	less than
<<	much less than
≤	less than or equal to
>	greater than
≥	greater than or equal to

Prior Informed Consent Decision Guidance Document

Captafol

1 Identification

1.1	**Common Name**	Captafol
	Other names/synonyms	Difolatan
1.2	**Chemical Type**	Phtalimide
1.3	**Use**	Pesticide (Fungicide)
1.4	**Chemical Name**	N-((1,1,2,2-tetrachloroethyl)thio)cyclohex-4-ene-1,2-dicarboximide (IUPAC) 3a,4,7,7a-tetrahydro-2- {(1,1,2,2-tetrachloroethyl)thio} H-isoindole -1,3(2H)-dione (CA)
1.5	**CAS No.**	2425-06-1
1.6	**Trade Names**	Haipen (Chevron), Crisfolatan, Difolatan (Chevron), Folcid, Foltaf (Rallis), Merpafol (Makhteshim-Agan), Sanspor (ICI), Ortho 5865 (Chevron), Santar (Sandoz), Sulfemide
1.7	**Mode of action as Pesticide**	Non-systemic fungicide (acts by inhibiting germination of spores
1.8	**Formulation Types**	Suspension concentrate, wettable powder, dustable powder, emulsifiable concentrates, flowable suspensions, water dispersible granule, pastes, coating agents
1.9	**Basic Manufacturers**	All India Medical Corp.; Sanko Co. Ltd (Japan); Pillar Int. Co. (Taiwan); Rallis India Ltd.; Makhteshim-Agan, Israel (manufacture ceased); (Chevron, the original manufacturer, has ceased production)

2 Summary of Control Actions

2.1 General

Control actions to ban or severely restrict captafol have been reported by 12 countries and the European Union[1] and the members associated with the EU in the European Economic Area. (EEA).[2] Of these control actions, two were voluntary withdrawals on the part of the manufacturer. In the United States the manufacturer voluntarily withdrew registrations following initiation of a special review. In New Zealand the manufacturer voluntarily withdrew most uses and products. One country reported that captafol was severely restricted, with a single use retained which represented

[1] Member States of the European Union: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, United Kingdom

[2] Member States of the European Economic Agreement: Iceland, Liechtenstein, Norway

less than 1% of the previous use level.

The actions reported by governments to IRPTC/UNEP are listed in Annex 1.

2.2 Reasons for the Control Actions

All countries listed carcinogenicity as a primary concern. In addition to carcinogenicity in laboratory animals and incidents of skin sensitisation in workers, environmental concerns were cited as the basis for concern, including very high toxicity to fish; moderate to very high toxicity to freshwater invertebrates; and potential for reproductive effects in birds.

2.3 Bans and restrictions

With the exception of New Zealand all countries reported that no pesticide uses were permitted

2.4 Uses Reported to be Continued in Effect

New Zealand has retained use as a tree wound dressing containing 10g/kg captafol in a petroleum wax base.

2.5 Alternatives

Specific alternatives were suggested by Australia, Thailand and the United States (Annex 2). Austria, Kuwait and Tanzania indicated that alternatives were available but made no specific recommendations.

It is important to remember that the effectiveness of any alternative pesticide needs to be established under conditions of use in specific crops and countries.

2.6 Contacts for Further Information

FAO/UNEP Joint Data Base, IRPTC, Geneva; Designated National Authorities in countries taking control actions and reporting alternatives (Annex 3).

3 Summary of Further Information on Captafol

3.1 Chemical and Physical Properties

The pure material is a colourless to pale yellow crystalline solid with a slight pungent odour. Melting point 162^{0}C. Technical material is a light tan colour with a pungent odour. Melting point range: 156-161^{o}C. Vapour pressure is negligible at room temperature. Practically insoluble in water at 20^{o}C (1-1.4 mg/litre) and slightly soluble in most organic solvents. Rapidly hydrolysed in acid or alkaline media (Royal Society of Chemistry, 1991).

3.2 Toxicological Characteristics

3.2.1 Classification

WHO	Class 1a; extremely hazardous; on the basis of carcinogenic effects in rats and mice
EU	Toxic, carcinogen Cat. II (probable human carcinogen)
IARC	Group 2A. (probable human carcinogen)

3.2.2 General

Metabolism In plants, hydrolysed to tetrahydrophthalimide (THPI) and dichloroacetic acid. THPI is degraded to tetrahydrophthalimidic acid and further to phthalic acid and ammonia. In animals, following oral administration, captafol is hydrolysed to tetrahydrophthalimide (THPI) and dichloroacetic acid. THPI is degraded to tetra-hydrophthalimidic acid and further to phthalic acid and ammonia.

3.2.3 Acute Toxicity

Oral Reported rat oral LD_{50s} (mg a.i./kg) 5000-6200 (Pesticide Manual, 1991); males 6780 and females 6330 (EPA, 1984)

Dermal Rabbit dermal LD_{50} 15,400 (IARC, 1953), (Ben Dyke *et al.*, 1970) - moderate dermal irritation at 72 hours. Severe dermal sensitisation (EPA, 1984)

Irritation Eye Irritation rabbit - corneal opacity, iris and conjunctive irritation present through day 21 (EPA, 1984)

3.2.4 Short-term Toxicity

Teratogenicity Captafol did not affect embryonic development in rabbits (Kennedy *et al.,* 1968) and monkeys (Vondruska *et al.*, 1971) but was embryolethal and teratogenic at high (maternally toxic) doses in hamsters (200 mg/kg bw on days 7 or 8 of gestation) (Robens, 1970, as quoted in IARC, 1991). *International Agency for Research on Cancer (IARC); Working Group on the Evaluation of Carcinogenic Risks to Humans, 1991.*

3.2.5 Chronic Toxicity

Carcinogenicity

FAO/WHO 1985 Joint Meeting on Pesticide Residues (JMPR). Two carcinogenicity studies in mice and a chronic toxicity study in rats were reviewed by the 1985 JMPR. In one mouse study, captafol caused an increased incidence of hemangioendotheliomas of the heart and malignant tumours of intestine (Ito *et al.*, 1984). Incidence of hemangio-endotheliomas were increased in a dose-related manner, and some metastasised. Incidences of both hemangioendotheliomas of the heart and small intestine tumours were higher in male mice than in females. In the other study (Eissenlord and Wong, 1982) malignant tumours of the heart were observed in the high dose group in both sexes and neoplastic lesions of the small intestine were observed in males, but in neither case were the increases statistically significant. Both studies therefore resulted in manifestation of similar biologically significant effects. In the rat study (Cox *et al*., 1983) captafol caused an increased incidence of neoplastic lesions in the kidneys of males in the high dose group which were also present in females at lower dose levels. Neoplastic nodules in the livers of females in the high dose group were also significantly increased. On the basis of these studies the meeting concluded that captafol is carcinogenic in both rats and mice. Because of the significance of the observed effect and because

a no-effect level was not demonstrated, no ADI was established. The meeting considered it unnecessary to review other
available data relating to the safety of captafol because of its conclusion regarding the carcinogenicity of the pesticide.

IARC 1991 Captafol was tested for carcinogenicity in one study in mice and in two studies in rats by oral administration. In mice it produced a high incidence of adenocarcinomas of the small intestine and of vascular tumours of the heart and spleen; the increase in tumours of the heart was dose related for animals of each sex (Ito *et al.,* 1984). In two studies in rats captafol produced a dose-related increase in the incidence of renal carcinomas in males (Nyska *et al.,* 1989; Tamano et al 1990); in one of these, it also induced dose-related increases in the incidence of benign renal tumours in females and of liver tumours in males and females (Tamano *et al*., 1990). There is *sufficient evidence* in experimental animals for the carcinogenicity of captafol. The overall conclusion was that captafol is *probably carcinogenic to humans (Group 2A).*

US EPA 1984 The US EPA reported an NOEL for non-oncogenic effects as 56 ppm based on a chronic toxicity study in rats. In the next highest dose cholangiectasis in liver, increase of hyperplasia of tubule epithelium, megalocytic cells and transitional cell hyperplasia in the kidney, increased erosion/ulceration hyperkertosis/acanthosis, ground substance in glandular mucosa and dilated pits in stomach were observed (EPA, 1984).

Other Effects Captafol is a skin sensitizer. Incidents of farm workers being disabled by its effects have been reported (EPA, 1984). It has caused allergic and contact dermatitis in man.

3.3 Environmental Characteristics

3.3.1 Fate

Captafol is not persistent and rapidly degrades in soil, the rate being a function of soil type and pesticide concentration: the longest determined half-life was 11 days. Under normal agricultural conditions there should be no accumulation in soil (JMPR, 1970). Limited data indicate that captafol *per se* has a half-life of < 3, 5 and 8 days in non-sterile organic sandy and clay loam soils, respectively. The soil degradates and metabolites have not been identified (EPA, 1984). The movement of captafol through soil columns by water leaching has been studied. The results show that captafol does not move significantly and will not accumulate in water leaching from treated areas (JMPR ,1970).

3.3.2 Effects

Fish Highly toxic to fish; 96-h LC_{50s}; Rainbow trout, 0.027-0.50 mg/l; Bluegill sunfish, 0.045-0.230 mg/l (EPA, 1984; Pesticide Manual, 1994)

Invertebrates	Moderately to very highly toxic to freshwater invertebrates; 96-h LC_{50s} ranged between 0.04 and 3 mg/l
Birds	Avian toxicity is low; LD_{50} >2510 ppm; LC_{50} >5620 ppm; however, high levels of exposure may cause reproductive impairment. Ten-day dietary LC_{50} for pheasants >23,070, mallard ducks >101,700 mg/kg diet (Royal Society of Chemistry, 1991).

3.4 Exposure

3.4.1 Food

Captafol and/or its metabolites and degradates are absorbed by roots and shoots of plants. Low-level exposure of the general population may occur through residues in food. Available data indicate that captafol residues on fruit are very stable under commercial storage conditions. However, captafol is extensively hydrolysed during thermal and other food processing. Captafol is non-systemic, thus residues would be readily removed by washing, blanching and peeling (JMPR, 1970).

3.4.2 Occupational/Use

Contact dermatitis has been reported after exposure to captafol (Stoke, 1979; Matsushita *et al*., 1980; and Brown, 1984 in IARC, 1991). During occupational exposure it has also been reported to cause severe irritation of the respiratory tract, eye damage and other systemic effects.

3.4.3 Environment

Captafol is not persistent in the environment. It does not leach significantly from basic soil types and is unlikely to contaminate ground water; little is known about the leachability and persistence of its metabolites and degradates. Direct applications or drift to water bodies can result in toxic exposure to fish and aquatic organisms. Because of the demonstrated high toxicity, exposure of aquatic organisms through drift and/or run-off is a cause for concern. Fish kills have been associated with the use of this pesticide at recommended rates. It is recommended that adequate precautions be taken to prevent contamination of surface and ground water.

3.4.4 Accidental Poisoning

Captafol is of low acute oral toxicity to mammals and is unlikely to be a cause of accidental acute poisoning from oral ingestion. It is a severe eye-irritant and can cause irreversible eye damage.

3.5 Measures to Reduce Exposures

Dietary exposure can be reduced by controlling presence of residues in food. The 1985 JMPR recommended that captafol should not be used where residues in food can arise. Restriction of use to mechanically harvested crops and use of gloves and protective clothing by harvesters can reduce the skin sensitisation problem for workers.

Captafol is classified as a "restricted use" pesticide in the USA, thus making it available only to certified applicators trained in the application and handling of " restricted use" pesticides. In the USA a 24-hour re-entry interval was required in the absence of full body clothing

Protective clothing and gloves will protect those handling and applying captafol. Additionally, goggles or a face shield should be worn.
Avoid contact with the solid or dust. Keep spectators away from any leakage. This pesticide is highly toxic for fish. Prevent contamination of other goods or cargo, and of nearby vegetation and waterways.
Warnings and precautions to avoid drift and run-off from treated areas and contamination from cleaning of equipment and disposal of wastes can minimise impacts on aquatic organisms.

3.6 Packaging and Labelling

Labels should include precautions and warnings related to applicator, handler and worker exposure, as well as hazards to aquatic organisms. Refer to the FAO Guidelines on Good Labelling Practice for Pesticides (1995).

3.7 Waste Disposal Methods

3.7.1 Waste treatment

Absorb spilled liquid products using earth or sand. If available, sawdust, peat moss or straw are also suitable absorbents; sweep up and place in a separate container. Empty any product remaining in damaged or leaking containers into a clean empty container, which should be suitably labelled. Sweep up any spilled powder with damp sawdust, taking care not to raise a dust cloud (use a vacuum cleaner). Remove trapped material with suction hoses. Place in a separate container for subsequent disposal. Use mechanical dredges or lifts to remove immobilised masses of pollutants and precipitates. Before disposal, captafol can be concentrated by gravity separation followed by dual media filtration and activated carbon adsorption. Alkaline treatment of captafol leads to the formation of degradation products of much lower toxicity. For treatment of large spills, or for the decontamination of equipment, the use of an aqueous solution of commercial low-foaming, hard-water detergent in 5% trisodium phosphate or 10-25% sodium hydroxide is recommended. During neutralisation, hydrogen sulphide may be formed if insufficient alkali is used.

3.7.2 Disposal

Do not deposit in landfills. Captafol is not amenable to biological treatment at municipal sewage plants.

3.8 Maximum Residue Limits

All Codex maximum residue limits (CXLs) were withdrawn by the Codex Alimentarius Commission in 1987 on the basis of the conclusions of the 1985 JMPR and a recommendation by the Codex Committee on Pesticide Residues (CCPR) in 1987 (ALINORM 87/24A, paras. 13-16).

4 Major References

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FAO (1970). Evaluations of some pesticide residues in food, Monograph; Food and Agriculture Organization/World Health Organization, Rome

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Associated references

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Robens, J.F. (1970). Teratogenic activity of several phthalamide derivates in the golden hamster. Toxicol. Appl. Pharmacol. 16, 24-34

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Tamano, S., Kurata, Y., Yamada, M., Yamamoto, A., Hagiwara, A., Cabral, R., & Ito, N. (1990) Carcigenicity of captafol in F344/DuCrj rats. Jpn. J. Cancer Res. 81, 1222-1231

Vondruska, J.F., Fanchier, O.E. & Calandra, J.C. (1971). An investigation into the teratogenic potential of captan, folpet and difolatan in nonhuman primates. Toxicol. Appl. Pharmacol. 18, 619-624

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U.S. Environmental Protection Agency (1984). Pesticide fact sheet, no. 35: Captafol. EPA, Washington, D.C.

WHO/IPCS (1990). Captafol Health and Safety Guide (No. 49), WHO/International Programme on Chemical Safety (IPCS), Geneva

WHO (1996). The World Health Organization Recommended Classification of Pesticides by Hazard and Guidelines to Classification 1996-1997. World Health Organization, Geneva, WHO/PCS/96.3

Worthing, C.R. and R.J. Hance (Eds.) (1994). The Pesticide Manual: A World Compendium. (10th ed.). British Crop Council, Surrey, United Kingdom

ANNEX 1

Summary of Control Actions and Remaining Uses as Reported by Countries

Actions taken and year effective

Bans

Argentina	
Control Action	Import, manufacture, fractionation, commercialisation and use of products for agricultural use formulated on the basis of this active ingredient are banned.
Effective	16/10/1990
Uses still allowed	
Reasons for control action	Carcinogenicity

Australia	
Control Action	All uses in cherries, nectarines, peaches, apples, peanuts, pineapples and tomatoes have been cancelled.
Effective	
Uses still allowed	No remaining uses allowed
Reasons for control action	Evidence of tumour induction in mice and mutagenicity in a number of test systems

COLOMBIA	
Control Action	The substance is banned for use
Effective	7/12/89
Uses still allowed	No remaining uses allowed
Reasons for control action	Carcinogenicity

Cyprus	
Control Action	Banned as agricultural pesticide
Effective	31/03/1989
Uses still allowed	
Reasons for control action	Captafol is carcinogenic for rats and mice. It may be a potential human carcinogen.

European Union[i] and EEA[ii]	
Control Action	The placing on the market and the use of all plant protection products containing captafol as an active ingredient are prohibited (total ban).
Effective	31/12/1990
Uses still allowed	No remaining uses allowed.
Reasons for control action	Use of captafol in plant protection products is likely to give rise to harmful effects of human and animal health. Captafol has been classified by the EC as a category 2 carcinogen (probably carcinogenic to humans).

Fiji, Republic of	
Control Action	Banned for all use
Effective	01/01/1987
Uses still allowed	No remaining uses allowed
Reasons for control action	

Hungary	
Control Action	Total ban on use as a pesticide
Effective	30/09/1987
Uses still allowed	
Reasons for control action	Captafol is carcinogenic for both rats and mice, therefore should be assumed to be a potential human carcinogen.

Kuwait	
Control Action	Banned for use as a pesticide
Effective	01/01/1985
Uses still allowed	No remaining uses allowed
Reasons for control action	More safe alternatives are available.

Sri Lanka	
Control Action	Banned for use as a pesticide
Effective	26/01/1989
Uses still allowed	No remaining uses allowed
Reasons for control action	Based on carcinogenicity proven in rats and mice as per WHO/PCS/89

Tanzania, United Republic of	
Control Action	Total ban
Effective	25/03/1986
Uses still allowed	
Reasons for control action	Carcinogenicity

Thailand	
Control Action	All agricultural uses banned. Decision from the Toxic Substance Controlling Board.
Effective	01/04/1986
Uses still allowed	
Reasons for control action	Carcinogenicity

Voluntary Withdrawals

New Zealand	
Control Action	Voluntary withdrawal of most uses and products.
Effective	01/08/1989
Uses still allowed	One tree wound dressing formulation containing 10g/kg captafol in a petroleum wax base. Existing use: less than 1% of previous use.
Reasons for control action	Human health reasons (possible carcinogen, teratogenicity)

United States	
Control Action	The substance has been voluntarily withdrawn by the registrant. In January 1985, EPA initiated a special investigation of captafol. Subsequent to the initiation of the investigation, the registrants voluntarily cancelled their registrations, effective as of 15/05/87.
Effective	15/05/1987
Uses still allowed	No remaining uses allowed.
Reasons for control action	Captafol is: oncogenic in rats and mice; highly toxic to fish; a skin sensitizer (incidents of farm workers being disabled from its effects have been reported); moderately to very highly toxic to freshwater invertebrates; found to have strong potential for reproductive effects in birds; found to cause potential problems related to endangered species.

ANNEX 2

Alternatives

The following alternatives were noted by countries reporting import decisions under the PIC procedure:

Country	
Australia	thiram, sulphur, copper oxychloride, copper hydroxide, metiram, ziram, zineb, triforine, mancozeb, dithianon, dichlone, fenarimol, thiophanate-methyl, carbendazim, fenaminosulf, metalaxyl
Thailand	captan, metalaxyl
United States:	captan, chlorthalonil, dichlone, folpet, maneb, mancozeb, metalaxyl, metiram, thiram, triforine, ziram

It is essential that before a country considers substituting any of these reported alternatives, it ensures that the use is relevant to its national needs. A first step may be to contact the DNA in the country where the alternative has been reported (see address: Annex 3). It will then be necessary to determine the compatibility with national crop protection practices.

ANNEX 3

List of Pesticide DNAs in Countries Reporting Control Actions or Alternatives

Argentina	P	Director General Instituto Argentino de Sanidad y Calidad Vegetal Ing. Huergo No 1001 C.P. 1060 Buenos Aires	Tlx: 27 637 DGAAGAR Fax: 541 1615
	C	Dr. M.A. Craviotto Dirección Nacional de Calidad Ambiental Subsecretaria de Vivenda y Calidad Ambiental Av. 9 de Julio 1925-Piso 17 C.P. 1332 Buenos Aires	Tel: 54-1 381 1949 54-1 383 8741 Fax: 54-1 331 0680
Australia	P	Mr. Ian Coleman Agricultural and Veterinary Chemicals Policy Section Dept. of Primary Industries and Energy GPO Box 858 Canberra ACT 2601	Tel.: 0061 6 271 6371 Fax.: 0061 6 272 5899 Email:icoleman@dpie.gov.au
	C	Assistant Secretary Environment Standard Branch Environment Protection Agency (EPA) 40 Blackall St. Barton ACT 2600 (Attn.: Ms. Kaye Dal Bon)	Fax: 616 274 1172 Tel: 616 274 1757
Belgium	CP	Service Maîtrise des risques Section Pesticides (bureau 2/309) Ministère de la santé publique et de l'environnement Cité Administrative de l'Etat 1010 Bruxelles (Attn. Mr. R. Huysman)	Tel: 32 2 2104881 Fax: 32 2 2104884
Colombia	P	Director General Instituto Colombiano Agropecuario Ministerio de Agricultura Calle 37 No.8-43, Piso 4 y 5 Apartado Aéreo 7984 Bogotá	Tel: 57-1-285 5520 Fax: 57-1-285 4351
Cyprus	P	The Chairman Pest Control Products Bd. Department of Agriculture,, Ministry of Agriculture & Natural Resources Nicosia	Tel: 30-2250/30-2254 Tlx: 4660 Minagri CY Cab: MINAGRI CYPRUS Fax: 361425 Nicosia
	C	Director Environment Service Ministry of Agriculture, Natural Resources & Environment Nicosia	Tel: 30-2883 Tlx: 4660 Minagri CY Cab: MINAGRI CYPRUS Fax: 363945 Nicosia
Fiji	P	The Deputy Permanent Secretary Services Ministry of Agriculture, Fisheries and Forests G.P.O. Box 358, Suva	Tel: (679) 311233 Fax: (679) 302478

Hungary		The Director Plant Health and Soil Cons. Dept. Ministry of Agriculture & Food Kossuth L.tér 11 1055 Budapest	Tel: 36 (1) 1533000 Tlx: 22-5445 Fax: 36 (1) 1530518
Kuwait	P	The Director Plant Wealth Department The Public Authority for Agriculture Affairs & Fish Res. P.O. Box 21422 13075 Safat	Tel: (965) 2452790, 2456835/36 Tlx: 46408 EP CNCL KT Fax: (965) 2421993-2456836
New Zealand	CP	Mr. D.W. Lunn Chief Scientist (Pesticides) Agricultural Compounds Unit Ministry of Agriculture & Fisheries P.O. Box 40-063 Upper Hutt	Tel: 064 4 528-6089 Fax: 064 4 528-4675
Tanzania, United Republic of	P	The Registrar of Pesticides Tropical Pesticides Research Inst. P.O. Box 3024 Arusha (Attn.:Mr. H.A. Lyatuu)	Tel: 057 8813/4/5 Fax: 057 8217 Tlx: 42002 TPRI TZ
Thailand	P	The Director General Dept. of Agriculture Ministry of Agriculture and Cooperatives Rajadamnern Ave. Bangkok 10200	Tel: 66 (2) 281-9313
Thailand	CP	The Director-General Pollution Control Department 539/2 Gypsym Bldg., Fl. 16, 17 Si Ayutthaya Road, Phayathai Ratchathewi Bangkok 10400	Tel: 66 (2) 579-0586/579-6936 Tlx: 20838 MINISTEN TH Cab: NALENBO BANGKOK
USA	CP	The Assistant Administrator for Pesticides and Toxic Substances Environmental Protection Agency 401 M St. S.W. Washington DC 20460	Tel: 1 202 260 2902 Fax: 1 202 260 1847 Tlx: 892758 EPA WSH

	C	Industrial and consumer product chemicals
	P	Pesticides
	CP	Pesticides, industrial and consumer product chemicals