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

Food and Agriculture Organization of the United Nations
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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.

This document is intended to serve as a guide and to assist authorities in making a sound decision on whether to continue to import, or to prohibit import, of these chemicals because of health or environmental reasons. While the information provided is believed to be accurate according to data available at the time of preparation of this Decision Guidance Document, FAO and UNEP disclaim any responsibility for omissions or any consequences that may flow therefrom. Neither FAO or UNEP, nor any member of the FAO/UNEP Joint Group of Experts shall be liable for any injury, loss, damage or prejudice of any kind that may be suffered as a result of importing or prohibiting the import of these chemicals.

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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
°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
LC₅₀ lethal concentration, 50%
LD₅₀ 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

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 less than 1% of the previous use level.

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\(^1\) 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
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°C. Technical material is a light tan colour with a pungent odour. Melting point range: 156-161°C. Vapour pressure is negligible at room temperature. Practically insoluble in water at 20°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

<table>
<thead>
<tr>
<th>Organisation</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>WHO</td>
<td>Class 1a; extremely hazardous; on the basis of carcinogenic effects in rats and mice</td>
</tr>
<tr>
<td>EU</td>
<td>Toxic, carcinogen Cat. II (probable human carcinogen)</td>
</tr>
<tr>
<td>IARC</td>
<td>Group 2A. (probable human carcinogen)</td>
</tr>
</tbody>
</table>

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

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Oral</td>
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<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

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

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.
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).

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/acinanthosis, 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
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

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

Associated references
Chronic Toxicity Study in Rats. DIFOLATAN. Hazelton Laboratories

FAO (1995). Revised guidelines on Good Labelling Practice for Pesticides. Food and Agriculture Organization, Rome


Associated references:


## ANNEX 1

**Summary of Control Actions and Remaining Uses as Reported by Countries**

### Actions taken and year effective

#### Bans

<table>
<thead>
<tr>
<th>Country</th>
<th>Control Action</th>
<th>Effective Date</th>
<th>Uses still allowed</th>
<th>Reasons for control action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Argentina</td>
<td>Import, manufacture, fractionation, commercialisation and use of products for agricultural use formulated on the basis of this active ingredient are banned.</td>
<td>16/10/1990</td>
<td></td>
<td>Carcinogenicity</td>
</tr>
<tr>
<td>Australia</td>
<td>All uses in cherries, nectarines, peaches, apples, peanuts, pineapples and tomatoes have been cancelled.</td>
<td></td>
<td>No remaining uses allowed</td>
<td>Evidence of tumour induction in mice and mutagenicity in a number of test systems</td>
</tr>
<tr>
<td>Colombia</td>
<td>The substance is banned for use</td>
<td>7/12/89</td>
<td>No remaining uses allowed</td>
<td>Carcinogenicity</td>
</tr>
<tr>
<td>Cyprus</td>
<td>Banned as agricultural pesticide</td>
<td>31/03/1989</td>
<td></td>
<td>Captafol is carcinogenic for rats and mice. It may be a potential human carcinogen.</td>
</tr>
</tbody>
</table>
| **European Union\(^1\) and EEA\(^2\)** | The placing on the market and the use of all plant protection products containing captafol as an active ingredient are prohibited (total ban).  
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** | Banned for all use  
01/01/1987  
No remaining uses allowed |
| **Hungary** | Total ban on use as a pesticide  
30/09/1987  
Captanfol is carcinogenic for both rats and mice, therefore should be assumed to be a potential human carcinogen. |
| **Kuwait** | Banned for use as a pesticide  
01/01/1985  
No remaining uses allowed  
More safe alternatives are available. |
| **Sri Lanka** | Banned for use as a pesticide  
26/01/1989  
No remaining uses allowed  
Based on carcinogenicity proven in rats and mice as per WHO/PCS/89 |
| **Tanzania, United Republic of** | Total ban  
25/03/1986  
Carcinogenicity |
| **Thailand** | All agricultural uses banned. Decision from the Toxic Substance Controlling Board.  
01/04/1986  
Carcinogenicity |
## Voluntary Withdrawals

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

<table>
<thead>
<tr>
<th>United States</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Control Action</strong></td>
<td>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.</td>
</tr>
<tr>
<td><strong>Effective</strong></td>
<td>15/05/1987</td>
</tr>
<tr>
<td><strong>Uses still allowed</strong></td>
<td>No remaining uses allowed.</td>
</tr>
<tr>
<td><strong>Reasons for control action</strong></td>
<td>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.</td>
</tr>
</tbody>
</table>
**ANNEX 2**

**Alternatives**

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

<table>
<thead>
<tr>
<th>Country</th>
<th>Alternatives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>thiram, sulphur, copper oxychloride, copper hydroxide, metiram, ziram, zineb, triforine, mancozeb, dithianon, dichlone, fenarimol, thiophanate-methyl, carbendazim, fenaminosulf, metalaxyl</td>
</tr>
<tr>
<td>Thailand</td>
<td>captan, metalaxyl</td>
</tr>
<tr>
<td>United States:</td>
<td>captan, chlorthalonil, dichlone, folpet, maneb, mancozeb, metalaxyl, metiram, thiram, triforine, ziram</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Country</th>
<th>Type</th>
<th>Name</th>
<th>Address</th>
<th>Tlx/Email/Tel/Fax</th>
</tr>
</thead>
<tbody>
<tr>
<td>Argentina</td>
<td>P</td>
<td>Director General</td>
<td>Instituto Argentino de Sanidad y Calidad Vegetal</td>
<td>27 637 DGAAGAR</td>
</tr>
<tr>
<td>Argentina</td>
<td>C</td>
<td>Dr. M.A. Craviotto</td>
<td>Dirección Nacional de Calidad Ambiental</td>
<td>54-1 381 1949</td>
</tr>
<tr>
<td>Australia</td>
<td>P</td>
<td>Mr. Ian Coleman</td>
<td>Agricultural and Veterinary Chemicals Policy Section</td>
<td>0061 6 271 6371</td>
</tr>
<tr>
<td>Australia</td>
<td>C</td>
<td>Assistant Secretary</td>
<td>Environment Standard Branch</td>
<td>616 274 1172</td>
</tr>
<tr>
<td>Belgium</td>
<td>CP</td>
<td>Service Maîtrise des risques</td>
<td>Ministère de la santé publique et de l'environnement</td>
<td>32 2 2104881</td>
</tr>
<tr>
<td>Colombia</td>
<td>P</td>
<td>Director General</td>
<td>Instituto Colombiano Agropecuario</td>
<td>57-1-285 5520</td>
</tr>
<tr>
<td>Cyprus</td>
<td>P</td>
<td>The Chairman</td>
<td>Pest Control Products Bd.</td>
<td>30-2250/30-2254</td>
</tr>
<tr>
<td>Cyprus</td>
<td>C</td>
<td>Director Environment Service</td>
<td>Ministry of Agriculture, Natural Resources &amp; Environment</td>
<td>30-2883</td>
</tr>
<tr>
<td>Fiji</td>
<td>P</td>
<td>The Deputy Permanent Secretary Services</td>
<td>Ministry of Agriculture, Fisheries and Forests</td>
<td>(679) 311233</td>
</tr>
<tr>
<td>Hungary</td>
<td>P</td>
<td>The Director</td>
<td>Plant Health and Soil Cons. Dept.</td>
<td>36 (1) 1533000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Ministry of Agriculture &amp; Food</td>
<td>22-5445</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Kossuth L.tér 11</td>
<td>36 (1) 1530518</td>
</tr>
</tbody>
</table>

Captafol
Kuwait  P  The Director
Plant Wealth Department
The Public Authority for Agriculture Affairs & Fish Res.
P.O. Box 21422
13075 Safat

New Zealand  CP  Mr. D.W. Lunn
Chief Scientist (Pesticides)
Agricultural Compounds Unit
Ministry of Agriculture & Fisheries
P.O. Box 40-063
Upper Hutt

Tanzania, United Republic of  P  The Registrar of Pesticides
Tropical Pesticides Research Inst.
P.O. Box 3024 Arusha
(Attn.:Mr. H.A. Lyatuu)

Thailand  P  The Director General
Dept. of Agriculture
Ministry of Agriculture and Cooperatives
Rajadamnern Ave.
Bangkok 10200

Thailand  CP  The Director-General
Pollution Control Department
539/2 Gypsum Bldg., Fl. 16, 17
Si Ayutthaya Road, Phayathai Ratchathewi
Bangkok 10400

USA  CP  The Assistant Administrator for Pesticides and Toxic Substances
Environmental Protection Agency
401 M St. S.W.
Washington DC 20460

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