

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

DECISION GUIDANCE DOCUMENTS

DDT

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



UNEP

United Nations Environment Programme



Food and Agriculture Organization
of the United Nations

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Rome - Geneva 1991

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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 have recommended that these chemical 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
HEOD	
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 10 ³) kilogram
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. (For difference between draft MRLs and Codex MRLs, see the introduction Annex I.)
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
ppm	parts per million (Used only in reference to concentration of a pesticide in an experimental diet. In all other contexts the terms mg/kg or are used).
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

DDT

PRIOR INFORMED CONSENT DECISION GUIDANCE DOCUMENT

1. IDENTIFICATION

1.1 Common Name: DDT

1.2 Chemical Type: Organochlorine

1.3 Use: Pesticide (insecticide)

1.4 Chemical Name: 1,1,1-trichloro-2,2-bis (4-chlorophenyl) ethane

1.5 CAS No.: 50-29-3

1.6 Trade Names/Synonyms: Anofex, Arkotine, Cazarex, Chlorophenothane, clofenotane, ddt 75% wdp, Dicophane, Didigam, Didmac, Digmar, Dinocide, ENT 1,506, Estonate, Genitox, Gesarol, Guesaphon, Guesarol, Gyron, Ixodex, Klorfenoton, Kopsol, NCI-C00464, Neocid, Neocidal, Pentachlorin, Pentech, pp'zeidane, Rukseam, Santobane, zeidane, Zerdane

1.7 Mode of Action: Non-systemic stomach and contact insecticide.

1.8 Formulation Types: Solutions in xylene, emulsifiable concentrates, wettable powders, granules, aerosols.

1.9 Basic Producers: EniChem Synthesis S.p.A. (Italy), Hindustan Insecticides, Ltd. (India), P.T. Montrose Pesticido Nusantara (Indonesia)

2. SUMMARY OF CONTROL ACTIONS

2.1 General: Control actions to ban or severely restrict DDT have been taken by over 38 countries beginning as early as the 1970's.

In at least 26 countries, DDT has been completely banned and in 12 others it is severely restricted. In these latter cases, it is permitted for use by government agencies for special programmes. Specific actions reported by governments are summarized in Annex 1.

2.2 Reasons for the Control Action: The characteristics of DDT to persist, especially in temperate climates, and to biomagnify in the food chain led to significant reproductive effects in birds, such as the brown pelican, osprey and eagles, because of egg shell thinning. These features combined with exposure and accumulation of residues in humans, and the potential oncogenicity of DDT also contributed to health concerns. In addition, there were concerns about general environmental contamination of a longlived nature and uncertainty about the eventual adverse impacts on man and the environment because of continuing, long-term exposure through water, food and other sources. Finally, DDT is toxic to a number of organisms including fish.

- 2.3 Uses Banned: In most cases all uses are banned, particularly outdoor uses and general use on agricultural commodities. Severe restrictions permit the very limited use principally for public health purposes and a few agricultural purposes. Details provided by reporting countries are in Annex 1.
- 2.4 Uses Reported to be Continued in Effect: As noted, uses remaining in effect are few and tightly controlled by governments, consisting principally of public health use for vector control for malaria and bubonic plague and for a few agricultural uses. Uses reported remaining in effect by governments are summarized in Annex 1. Other uses may well be continuing in countries whose governments have not reported a control action to FAO/UNEP.
- 2.5 Alternatives: Countries controlling DDT have found many alternatives, too numerous to attempt to describe here, for specific purposes. It is noted that many of the alternatives are more acutely toxic to humans than DDT.
- 2.6 Contacts for Further Information: FAO/UNEP Joint Data Base, IRPTC Geneva; Designated National Authorities in countries taking control actions.

3. **SUMMARY OF FURTHER INFORMATION ON DDT**

- 3.1 Chemical and Physical Properties: Technical DDT is of variable composition and may consist of 11 or more compounds, principally the pp'-isomer (up to 70%) and the op'-isomer (15-30%). Pp'-DDT is a white crystalline solid, the technical mixture a white or cream coloured waxy solid or amorphous powder. DDT is soluble in most aromatic and chlorinated solvents and practically insoluble in water. International specifications have been developed for DDT by FAO.
- 3.2 Toxicological Characteristics:
- 3.2.1 Acute Toxicity: Rat Oral LD₅₀; 113 mg ai/kg bw. Rat Dermal LD₅₀; 2510 mg ai/kg bw. WHO Classification: ai: Class II-moderately hazardous.
- Formulations: Below 200 g/kg for solids and 500 g/l for liquids - Class III, otherwise Class II.
- 3.2.2 Short-term Toxicity: DDT mainly affects the central and peripheral nervous system and the liver. It appears to be embryotoxic in mice (2.5 mg/kg/day). The NOEL is 0.25 mg/kg/day.
- 3.2.3 Chronic Toxicity: IARC concludes that DDT is a non-genotoxic liver carcinogen in mice. The NOEL is 0.3 mg/kg/day; a tolerated daily intake of 0.02 mg/kg/day is proposed. No evidence of carcinogenicity in humans. JMPR/Codex ADI: 0.02 mg/kg
- 3.3 Environmental Characteristics:
- 3.3.1 Fate: Average half-life is at least 5 years. Preferentially stored in fat, with bioconcentration factors up to 50,000 (fish) or 500,000 (mussel).
- 3.3.2 Effects: Highly toxic to fish (LC₅₀: 1.5 µg/l for large mouth bass to 56 µg/l for guppy) and aquatic invertebrates (at concentrations as low as 0.3 µg/l): lowers reproductive rate in birds (0.6 mg/kg) by thinning of shells and embryotoxicity, but is relatively non-toxic to earthworms and bees.

3.4 Exposure:

3.4.1 Food: Believed to account for 90% of the DDT stored in the general population. DDT has been found in adipose tissues of large proportions of the population in countries of use. In the US these levels have decreased significantly since the use of DDT was banned.

3.4.2 Occupational/Use: Dust packing plants: levels of 2-104 mg/m³ have been reported (TLV = 10 mg/m³), maximum uptake of 18 mg/man/day has been estimated for formulators (0.3 mg/kg/day for a 60 kg person compared with ADI of 0.25 mg/kg/day and proposed TDI of 0.02 mg/kg/day; users can be exposed maximally to 8 mg/m³. Workers have the potential to be exposed at or above the limiting values established on the basis of the toxicological data.

3.4.3 Environment: Water concentrations may be high in agricultural areas (0.01 mg/l). Bioaccumulation in the food chain can provide significant exposure for humans and wildlife.

3.4.4 Accidental Poisoning: Very few cases of poisoning have been observed. Diazepam (anticonvulsant), sedatives, ionic calcium or glucose have been suggested as possibly useful.

3.5 Measures to Reduce Exposures: Since DDT can be absorbed by ingestion, by inhalation and to some extent through the skin, respiratory and dermal protection can reduce exposure to workers and users. Because of its persistence and bioaccumulation, exposure to the environment and the general population can be reduced principally through controlling and limiting use.

3.6 Packaging and Labelling: Follow FAO Guidelines on Good Labelling Practice.

3.7 Waste Disposal Methods: Guidelines are under development. This section will be updated when guidelines are available.

3.8 Maximum Residue Limits (MRLs) (mg/kg):

JMPR/Codex: Codex has changed designation of limits for many commodities from MRLs to ERLs (Extraneous Residue Limits) recognizing the widespread banning of uses in agriculture and that most residues would be the result of previously authorized uses. Levels (in mg/kg) currently are: ERLs; cereal grains, 0.1; Eggs (Poultry), 0.5; Meats (fat), 5; Milk, 0.05 - MRLs; Fruit and Vegetables, 1.0.

EEC: Cereals, 0.5; plant, 0.1; meat, 1.0; milk (fat), 0.04.

Some countries are reducing national residue limits to cover only environmental residues from previous uses. Food exporting countries using DDT should consider the MRLs in their market countries in making decisions on continued use of DDT.

4. **MAJOR REFERENCES:**

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Worthing, C.R. The pesticide manual-a world compendium. 8th Edition, The British Crop Protection Council (1987)

ANNEX 1
SUMMARY OF CONTROL ACTIONS AND REMAINING USES FOR DDT,
AS REPORTED BY COUNTRIES

BANNED:

Chile	(1985)	Banned.
Cuba	(1970)	Banned.
EEC-countries *	(1988)	Banned as agricultural chemical.
Liechtenstein	(1986)	Banned.
Mexico	(NS)	Banned as agricultural chemical.
Panama	(1987)	Banned as agricultural chemical.
Republic of Korea	(1986)	Banned.
Singapore	(1984)	Banned.
Sri Lanka	(NS)	Banned as agricultural chemical.
Sweden	(1975)	Banned as agricultural chemical.
Switzerland	(1986)	Banned.
Togo	(1981)	Banned as agricultural chemical.
USSR	(NS)	Banned as agricultural chemical.

WITHDRAWN:

Canada (1985) Last remaining product registration discontinued by registrant in 1985.
Poland (1976) Use discontinued since 1976.

SEVERELY RESTRICTED:

Dominica (NS) Severely restricted pesticide.
Mauritius (1970) Restricted use under the Pesticide Control Act of 1970.

Only remaining uses allowed:

Belize (NS) Public health use only.
Colombia (1986) Public health campaigns only.
Ecuador (1985) Public health use only (malaria).
Kenya (1987) Public health use only.

USA (1972) All uses cancelled except by US Public Health Service for control of vector diseases, health quarantine and in drugs for controlling body lice.

Venezuela (1983) Only permitted when intended for control of vectors for medical reasons by Ministry of Health, control of agricultural pests by Ministry of Agriculture.

Yugoslavia (1972) In forestry only permitted in control of large-scale attacks of certain pests. In human settlements only against certain pests if no risk of contamination of agricultural areas or water supplies.

* EEC-countries - Belgium, Denmark, France, Federal Republic of Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain and United Kingdom.

Specific uses reported as not allowed:

Argentina (1963-72) Prohibited for use as external parasiticide in cattle and swine (1968), for use in cultivation, commerce and industrial processing of tobacco (1971), for use as a scabicide in sheep in certain parts of the province of Buenos Aires (1963) and for use as antiweevil agent on seeds and their products intended for human or animal consumption (1972).

China (1982) Prohibited to use on fruit trees, tea, vegetables, herbs, tobacco, coffee, pepper.

Use permitted only with special authorization:

Japan (1981) Manufacture and import prohibited without authorisation by the Government.

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