United States
Environmental Protection
Agency

Office of Pesticides and Toxic Substances
Office of Pesticide Programs (TS-766C)
Washington, DC 20460

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EPA Pesticide Fact Sheet

Name of Chemical:	DCPA
Reason for Issuance:	Registration Standard
Date Issued:	June 6, 1988
Fact Sheet Number:	166

1. DESCRIPTION OF CHEMICAL

Generic Name:	Dimethyl tetrachloro-terephthalate
Common Names:	No common name has been assigned; DCPA is commonly used; other names in use are chlorothal and chlorothal-dimethyl
Trade Names:	Dacthal®
EPA Shaughnessy Code:	078701
Chemical Abstracts Service (CAS) Number:	1861-32-1
Year of Initial Registration:	1958
Pesticide Type:	Herbicide
Chemical Family:	Chlorinated benzoic acids
U.S. Producer:	Fermenta Plant Protection Company

2. USE PATTERNS AND FORMULATIONS

Application sites: Terrestrial food crops (Agricultural Crops), Terrestrial Nonfood Crops (Agricultural Crops), Ornamental Plants and Forest Trees, Domestic Outdoor (Ornamental Plants and Forest Trees).

Types of formulations: Formulation intermediates containing 50, 75 and 90 percent DCPA; Wettable Powders containing 25, 50, 60 75, and 90 percent DCPA and granulars containing 1.15 to 24.0 percent DCPA.

Types and methods of application:

Applied with ground or aerial equipment to soil pre-emergence to weed seed germination, broadcast or in bands, either post-plant, post-transplant or at layby. Applied to ornamental turf and lawns with either spray or granular equipment before weed seed germination.

Usual carrier: Water and fertilizers.

3. SCIENCE FINDINGS

Summary Science Statement: DCPA and its metabolites appear to have low acute and chronic toxicity based on the limited studies that are available. However, these products contain 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) and hexachlorobenzene (HCB) as impurities from the manufacturing of technical DCPA. These impurities have chronic toxicological properties (including oncogenic, teratogenic, fetotoxic, mutagenic or adverse effects on immune response in mammals) that are of particular concern in the reregistration of DCPA pesticide products. The Agency has classified both these impurities as Probable Human Carcinogens (Group B2). The Agency has performed preliminary assessments of the risks posed by these impurities and is requiring environmental fate and residue chemistry studies on the impurities in order to refine these risk assessments.

Chemical characteristics:

Physical state:	Crystalline solid
Color	White
Odor	Odorless
Melting point	156°C
Solubility	Insoluble in water, high in aromatic hydrocarbon solvents

Toxicological Characteristics of DCPA:

- Acute toxicity: Data gap.

- Dermal sensitizaton: Not a sensitizer in guinea pig.

- Subchronic toxicity: Data gap.

- Chronic toxicity: In an acceptable chronic oral toxicity of DCPA in dogs, four male and four female beagle dogs were dosed with DCPA at 100, 1,000, and 10,000 ppm in their diet. No compound-related effects were observed. The NOEL was 10,000 ppm.

  In a chronic toxicity study in rats, 35 male and 35 female rats were dosed with DCPA at 100, 1,000 and 10,000 ppm in their diets for 2 years. At termination of the study, the kidney weights in males and the adrenal weights of females were significantly higher than controls. The NOEL was 1,000 ppm (50 mg/kg/day). The LEL was 10,000 ppm (500 mg/kg/day).

- Oncogenicity: Data gap.

- Reproductive toxicity: Data gap.

- Teratology: Twenty-five bred female Charles River rats were fed 500, 1,000, and 2,000 mg/kg/day. No compound related effects were observed in the dams or the fetuses at the highest dose tested.

- Mutagenicity: DCPA did not induce toxic effects in in an in vivo dominant lethal study when administered to male rats in a single treatment of 3.16, 31.6 and 316 mg/kg prior to mating.

- Metabolism: Data gap.

Physiological and Biochemical Characteristics:

- Mechanism of pesticidal action: DCPA appears to inhibit the normal cell division of root tips of a wide spectrum of plants. The precise mechanism of this effect is not understood.

- Metabolism and persistence in plants and animals: Plants: Radio-labeled DCPA was not translocated from treated leaves of cotton plants. If applied to soil or nutrient solution roots of cotton plants appeared to absorb it and translocate it to the stems and foliage of the plants. Monomethyl tetrachloroterephthalate (MTP) and tetrachloroterephthalic acid (TPA) and DCPA have been detected in residue studies from numerous agricultural commodities.

Animals: Non-radiolabeled studies have detected DCPA, MTP and TPA in ruminants and poultry. ^{14}C-DCPA studies are needed for both metabolism of DCPA in animals and plants

Environmental Characteristics:

- Environmental fate data include a hydrolysis study which indicates that DCPA is stable to hydrolysis for up to 36 days.

- Data gaps exist for all other environmental fate requirements.

- DCPA and its degradates were detected in ground water samples in four states. The highest level detected was 1139 parts per billion (ppb). The Agency has proposed a drinking water health advisory level of 3500 ppb. A ground water monitoring study is required to assess the extent of ground water contamination.

Ecological Characteristics:

- Acute avian oral toxicity: data gap.

- Avian dietary toxicity: data gap.

- Avian reproductive toxicty: data gap.

- Freshwater fish acute toxicity: LC_{50} = >100 to >320 ppm (practically nontoxic) for bluegill sun fish and LC_{50} = 30 ppm (slightly toxic) for rainbow trout.

- Freshwater invertebrate acute toxicity: EC_{50} ranged from 27 ppm to 135 ppm (slightly to practically nontoxic) for Daphnia magna. LC_{50} >100 ppm (practically nontoxic) for Chironomus plumosus. LC_{50} >6.2 ppm (moderately toxic) for Gammarus pseudolimnacus.

- Estuarine and marine organisms acute toxicity: LC_{50} > 1,000 ug/L (practically nontoxic) for Brown shrimp (Penaeus aztecus). LC_{50} = 620 ug/L (practically non-toxic) fpr Eastern oyster (Crassostrea virginica). LC_{50} = >1,000 ug/L (practically nontoxic) for Sheepshead Minnow (Cyprinodon variegatus).

- Available information suggests there is no acute hazard to endangered aquatic species. No terrestrial endangered species have been associated with the use patterns of DCPA products. No data are available to evaluate the hazard to endangered avian species or endangered aquatic plant species.

Tolerance assessment:

- Tolerances have been established for residues of DCPA on raw agricultural commodities. (See table on the following page for a listing of tolerances.)

- Using a Provisional Acceptable Daily Intake (PADI) of 0.5 mg/kg/day based on the NOEL of 50 mg/kg/day observed in a chronic toxicity rat study, the Maximum Permissible Intake (MPI) for a 60 kg person is 30.0 mg/kg/day. Using this value, the Agency calculates that existing tolerances occupy 1.3 % of the ADI.

4. SUMMARY OF REGULATORY POSITIONS

A. The Agency will not initiate a Special Review on DCPA at this time. There are presently no chronic toxicological concerns for exposures to DCPA; however concerns for the chronic toxicological effects of the two manufacturing impurities 2,3,7,8-TCDD and HCB have not been resolved by the available information.

At the present time the Agency does not consider the risks due to 2,3,7,8-TCDD from the use of DCPA be unreasonable. The highest risk estimated was 10^{-6} for agricultural applicators and PCOs.

The Agency is concerned about the risks due to HCB from the use of DCPA which are 10^{-6} for dietary exposure and 10^{-4} for agricultural applicators, PCOs and a child exposed while playing on a treated lawn. The applicator exposures can be reduced by using protective clothing. The uncertainties in the exposure estimates used to assess the risk to children playing on a DCPA-treated lawn are so great that the Agency believes that the risk assessment cannot be used to determine whether criteria for inititing a Special Review have been exceeded. These exposure esitimates will be refined when data on foliar and soil exposure to HCB become available. The Agency believes the dietary risk to HCB from DCPA uses is acceptable while required metabolism and residue data are being developed.

B. The Agency is not classifying any DCPA uses as being for restricted use. As discussed above, the uncertainties in the exposure estimates are very great. Accordingly, the Agency is unable to conclude that the risk posed by DCPA warrants its classification as a restricted use pesticide. The Agency will reconsider this position when the data it is requiring become available.

Table 1. Tolerances in parts per million (ppm) for residues of DCPA and metabolites MTP and TPA.

Raw Agricultural Commodity	Residues of DCPA Parts per Million			
	U.S.	Canada	Mexico	Codex
Beans, field dry	2	-	-	-
Beans, mung, dry	2	-	-	-
Beans, snap, succulent	2	-	-	-
Broccoli	1	-	-	-
Brussels sprouts	1	-	-	-
Cabbage	1	-	-	-
Cantaloupes	1	-	-	-
Cauliflower	1	-	-	-
Collards	2	-	-	-
corn, field, fodder	0.4	-	-	-
corn, field, forage	0.4	-	-	-
Corn, grain (including field and pop)	0.05	-	-	-
corn, pop, fodder	0.4	-	-	-
Corn, pop, forage	0.4	-	-	-
Corn, sweet (K + CWHR)	0.05	-	-	-
Corn, sweet, fodder	0.4	-	-	-
Corn, sweet, forage	0.4	-	-	-
Cottonseed	0.02	-	-	-
Cress, upland	5	-	-	-
Cucumbers	1	-	-	-
Eggplant	1	-	-	-
Garlic	1	-	-	-
Honeydew melons	1	-	-	-
Horseradish	2	-	-	-
Kale	2	-	-	-
Lettuce	2	-	-	-
Mustard, greens	5	-	-	-
Onions	1	-	-	-
Peas, southern, black-eyed	2	-	-	-
Peppers	2	-	-	-
Pimentos	2	-	-	-
Potatoes	2	-	-	-
Radish, roots	2.0	-	-	-
Radish, tops	15.0	-	-	-
Rutabagas	2	-	-	-
Soybeans	2	-	-	-
Squash, summer	1	-	-	-
Squash, winter	1	-	-	-
Strawberries	2	-	-	-
Sweet potatoes	2	-	-	-
Tomatoes	1	-	-	-
Turnips	2	-	-	-
Turnips, greens	5	-	-	-
Watermelons	1	-	-	-
Yams	2	-	-	-

C. The Agency is requiring registrants to certify that the levels of 2,3,7,8-TCDD and HCB in DCPA used to formulate their products do not exceed 0.1 ppb and 0.3 percent, respectively. This measure will assure that the levels of these impurities in commercially available DCPA products do not exceed the reported maximum levels upon which the Agency based its risk assessment. Registrants must also analyze their products for other species of dioxins and establish certified limits for these impurities as well.

D. The Agency will not register any significant new uses of DCPA until product chemistry, toxicology and residue chemistry data gaps have been filled.

E. The Agency is requiring ground water monitoring studies to assses the extent of ground water contamination. Because of the low toxicity of DCPA, the low levels observed in ground water to date, and the limited number of observations of ground water contamination, the Agency finds that additional regulatory action is not warranted.

F. The Agency is requiring dietary exposure information on DCPA impurities in order to determine the nature and magnitude of 2,3,7,8-TCDD and HCB residues. If these data show that these impurities or their metabolites accumulate in DCPA-treated agricultural commodities to levels that raise concerns about dietary risk, the Agency may find that additional regulatory action is warranted.

G. The Agency is requiring dislodgeable residue and foliar dissipation data on HCB in order to estimate dermal exposure to this impurity. These data are needed to refine the estimates of HCB exposure to farm workers and to users of DCPA-treated lawns.

H. The Agency is requiring the use of protective clothing and equipment for all uses of DCPA. End-use products registered for agricultural use or for professional use on ornamental turf must be labeled as follows:

> USE ONLY WHEN WEARING THE FOLLOWING PROTECTIVE CLOTHING AND EQUIPMENT DURING MIXING/LOADING AND APPLYING, REPAIR AND CLEANING OF MIXING, LOADING, AND APPLICATION EQUIPMENT, DISPOSAL OF THE PESTICIDE, AND EARLY REENTRY INTO TREATED AREAS: Wear a longsleeved shirt and long-legged pants and chemical resistant gloves.

IMPORTANT! If pesticide comes in contact with skin, wash off with soap and water. Always wash hands, face, and arms with soap and water before smoking, eating, drinking, or toileting. AFTER WORK: Before removing gloves, wash them with soap and water. Take off all work clothes and shoes. Shower using soap and water. Do not reuse contaminated clothing. Clothing worn during work must be laundered separately from household articles. Clothing that becomes heavily contaminated or drenched must be destroyed according to State and local regulations. HEAVILY CONTAMINATED OR DRENCHED CLOTHING CANNOT BE ADEQUATELY DECONTAMINATED.

End use products registered for homeowner uses must be labled as follows:

USE ONLY WHEN WEARING THE FOLLOWING PROTECTIVE CLOTHING: Wear long-sleeved shirt and long-legged pants and chemical resistant gloves.

IMPORTANT! If the pesticide comes in contact with skin wash off with soap and water. Always wash hands, face, and arms with soap and water before smoking, eating, drinking, or toileting.

AFTER USE: Before removing gloves, wash them with soap and water. Take off all work clothes and shoes. Shower using soap and water. Do not reuse contaminated clothing. Clothing worn during use must be laundered separately from household articles.

I. The Agency is imposing an interim 24-hr reentry interval for agricultural crop uses of DCPA pesticide products until required reentry data have been found to support a different reentry interval. End-use products registered for agricultural crop use must be labled as follows:

Do not enter treated areas for 24 hours after application unless wearing long sleeved shirt and long pants.

J. The Agency is imposing a required precautionary statement, environmental hazard statements, and statement of practical treatment, as follows:

All products must bear the following precautionary statement:

Causes moderate eye irritation. Avoid contact with eyes or clothing. Wash thoroughly with soap and water after handling.

All manufacturing use products must bear the following environmental hazard statement:

Do not discharge effluent containing this product into lakes, streams, ponds, estuaries, oceans, or public waters unless this product is specifically identified and addressed in an NPDES permit. Do not discharge effluent containing this product to sewer systems without previously notifying the sewage treatment plant authority. For guidance, contact your State Water Board or Regional Office of the EPA.

All nongranular end-use products must bear the following environmental hazard statements:

Do not apply directly to water or wetlands (swamps, bogs, marshes, and potholes). Do not contaminate water when disposing of equipment wastewater.

All granular end-use products must bear the following environmental hazard statements:

Collect and incorporate granules spilled on the soil surface. Do not apply directly to water or wetlands (swamps, bogs, marshes, and potholes). Do not contaminate water by cleaning of equipment or disposal of wastes.

All products must bear the following statements of practical treatment:

If in Eyes: Flush with plenty of water. Call a physican if irritation persists.

K. The Agency has determined that the following studies will receive priority review:

158.120 Product Chemistry

61-2 Description of Beginning Materials and Manufacturing Process
61-3 Discussion of Formation of Impurities
62-1 Preliminary Analysis

158.125 Residue Chemistry - DCPA

171-4 Nature of Residue (Metabolism)
-Plants
-Livestock
171-4 Residue Analytical Method
-Plant Residues
-Animal Residues
171-4 Storage Stability Data

158.125 Residue Chemistry - Impurities

171-4 Nature of Residue (Metabolism)
-Plants
-Livestock
171-4 Residue Analytical Method
-Plant Residues
-Animal Residues
171-4 Storage Stability Data

158.130 Environmental Fate

163-1 Leaching and Adsorption/Desorption
132-1 Foliar Dissipation
133-3 Dermal Exposure (Conditional, at option of Registrant)
133-4 Inhalation Exposure (Conditinal, at option of Registrant)
-- Ground Water Monitoring

5. SUMMARY OF MAJOR DATA GAPS

Product Chemistry

Toxicology:
Acute testing
Subchronic testing
Chronic testing
Special testing

Environmental Fate:
Photodegradation
Metabolism Studies - Laboratory
Mobility Studies
Dissipation Studies - Field
Accumulation Studies
Sub-division K, Reentry Studies
Ground water Monitoring

Ecological Effects:
Avian Testing
Aquatic Organism Testing
Nontarget Area Phytotoxicity

Residue Chemistry for DCPA Products:
Metabolism in Plants and Livestock
Residue Analytical Methods for Plants and Animals
Storage Stability Data for Raw Agricultural Commodities
Magnitude of Residues in Food and Feed Commodities

Residue Chemistry for Impurities in DCPA Products:
Metabolism in Plants
Residue Analytical Methods for Plant Residues
Magnitude of Residues in Raw Agricultural Commodities

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DISCLAIMER: The information presented in this Pesticide Fact Sheet is for informational purposes only and may not be used to fulfill data requirements for pesticide registration and reregistration. The complete Registration Standard for DCPA may be obtained from the National Technical Information Service (NTIS), Port Royal Road, Springfield, VA 22152 (Telephone No. 703-487-4650). Price for paper copies vary depending on the length of the document, microfiche copies are $5.95 each. When ordering you must furnish the NTIS with the stock number. The stock number may be obtained from the contact person identified above.