

Pesticide Toxicity Profile: Substituted Benzene Pesticides¹

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This document provides a general overview of human toxicity, provides a listing of laboratory animal and wildlife toxicities and a cross reference of the chemical, common and trade names of the substituted benzene pesticides registered for use in Florida.

General

The substituted benzene pesticides are a group of fungicides with a wide range of uses. Applications are made as treatments to seed, soil, and the foliage of vegetables and field crops, flowers, bulbs, and turfgrass. Some of the members of this pesticide family, such as pentachloronitrobenzene (PCNB), have been in use since the 1930s. PCNB is used to treat seed, soil at planting, and for selected foliage applications. The widely used fungicide, chlorothalonil, first became available in 1964 and has proven to be very useful in applications as a broad-spectrum foliage protectant fungicide. Another member of this group, chloroneb, is used for treatment of seed and turf while dicloran is registered

for use in Florida as a broad-spectrum fungicide used to protect perishable produce. One member of this group, hexachlorobenzene, has been discontinued for use in the United States. It was shown to cause adverse health effects to Turkish farm dwellers in the 1950s and some infant mortality occurred who were being nursed by exposed mothers. Product formulations of the substituted benzenes include wettable powders, dusts, water dispersible granules, emulsifiable concentrates, and granules.

Toxicity

Chloroneb has very low oral toxicity in mammals. It may be moderately irritating to skin and the mucous membranes. A metabolite of chloroneb, dichloromethoxyphenol, is excreted in the urine. No cases of systemic human poisoning have been reported. Chlorothalonil has caused irritation of skin, the mucous membranes of the eyes, and the respiratory tract upon contact. Allergic dermatitis has been reported, but no cases of systemic poisoning in humans have been recorded. Apparently,

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chlorothalonil is poorly absorbed across the skin and the gastrointestinal lining. Dicloran is absorbed by exposed workers, but is promptly eliminated, at least partly in the urine. No long-term adverse effects have been observed in humans. High concentrations of pentachloronitrobenzene in prolonged skin contact have caused sensitization in some tested volunteers, but have not been reported from occupationally exposed workers. Systemic poisonings have not been reported. Mammalian toxicities for the substituted benzene pesticides are shown in Table 1. Table 2 lists the toxicities to wildlife by the common name of the pesticide. Table 3 provides a cross listing of many of the trade names that these products are registered and sold by in Florida.

Additional Information

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Table 1. Substituted benzene pesticide mammalian toxicities (mg/kg of body weight).

Common name	Rat oral LD ₅₀	Rabbit dermal LD ₅₀
Chloroneb	>5,000	>5,000
Chlorothalonil	>10,000	>10,000
Dicloran	>5,000	>2,000
Pentachloronitrobenzene	>5,000	>5,000 (rat)

Table 2. Substituted benzene pesticide wildlife toxicity ranges.

Common name	Bird acute oral LD ₅₀ (mg/kg)*	Fish (ppm)**	Bee [†]
Chloroneb	PNT	MT	---
Chlorothalonil	PNT	ST	PNT
Dicloran	ST	MT	PNT
Pentachloronitrobenzene	PNT	HT	PNT

*Bird LD₅₀: Practically nontoxic (PNT) = >2,000; slightly toxic (ST) = 501 – 2,000; moderately toxic (MT) = 51 – 500; highly toxic (HT) = 10 – 50; very highly toxic (VHT) = <10.

**Fish LC₅₀: PNT = >100; ST = 10 – 100; MT = 1 – 10; HT = 0.1 – 1; VHT = <0.1.

†Bee: HT = highly toxic (kills upon contact as well as residues); MT = moderately toxic (kills if applied over bees); PNT = relatively nontoxic (relatively few precautions necessary).

Table 3. Cross reference list of common, trade and chemical names of substituted benzene pesticides.

Common name	Trade names*	Chemical name
Chloroneb	Terraneb®, Teremec®	1,4-dichloro-2,5-dimethoxybenzene
Chlorothalonil	Bravo®, Concorde®, Daconil®	Tetrachloroisophthalonitrile
Dicloran	Botran®	2,6-dichloro-4-nitroaniline
Pentachloronitrobenzene	Terraclor®	pentachloronitrobenzene

*Does not include manufacturers prepackaged mixtures.