



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

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OFFICE OF
PESTICIDES AND TOXIC SUBSTANCES

SUBJECT: Registration Standard for METHOXYCHLOR
(Environmental Fate & Ground Water Branch Chapter)

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Please find attached Table A (Generic Data Requirements) for the insecticide METHOXYCHLOR. There are currently no reviewable environmental fate studies on METHOXYCHLOR available in Branch files. A 1978 review of an EUP request found that none of the environmental fate studies, submitted to date, satisfied EPA's requirements for registering pesticides. In addition, no reviewable studies have been submitted since the 1978 review.

However, based on the available data, methoxychlor is stable to hydrolysis (half-life >200 days, 27°C, pH's 3-9), photodegradation in water (half-life: 4.5 months, pH 6.3), and aerobic soil metabolism (half-life >>3 months, sandy loam). The half-life for anaerobic soil metabolism has been reported at <1 month (sandy loam). Also, data indicate that methoxychlor has a high adsorption rate to soil sediment (k_d : 620).

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Groundwater contamination is likely to be minimal based on the fact that methoxychlor is essentially insoluble in water, sediment-water coefficients (k_d) have been reported at 620, and detection in groundwater has not been reported for nearly 1300 wells that have been sampled in ten states.

BACKGROUND:

Methoxychlor is used for insect control on a wide variety of sites including livestock, alfalfa, home orchards, ornamental shade trees, nonfood aquatic sites, greenhouse(food), and forestry sites. It is a chlorinated hydrocarbon structurally similar to DDT. Methoxychlor is used as a replacement for DDT when a risk to warm-blooded animals or sensitive plants exists. Considered to be persistent, methoxychlor, however, is not as stable in the environment as DDT.

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However, based on the available data, methoxychlor is stable to hydrolysis (half-life >200 days, 27°C, pH's 3-9), photodegradation in water (half-life: 4.5 months, pH 6.3), and aerobic soil metabolism (half-life >>3 months, sandy loam). The half-life for anaerobic soil metabolism has been reported at <1 month (sandy loam). Also, data indicate that methoxychlor has a high adsorption rate to soil sediment (k_d : 620).

Groundwater contamination is likely to be minimal based on the fact that methoxychlor is essentially insoluble in water, sediment-water coefficients (k_d) have been reported at 620, and detection in groundwater has not been reported for nearly 1300 wells that have been sampled in ten states.

Methoxychlor is applied as a foliar spray to ornamental shade trees, home orchards, and alfalfa. It is applied to livestock as a dust, dip, or spray.

Formulations include formulation intermediates, wettable powders, emulsifiable concentrates, dusts, flowable concentrates, granules, wettable powder/dusts, ready-to-use liquids, soluble concentrate/liquids, and pressurized liquids.

**TABLE A
GENERIC DATA REQUIREMENTS FOR METHOXYCHLOR**

Data Requirement	Composition 1	Use Pattern 2	Does EPA Have Data To Satisfy This Requirement? (Yes, No or Partially)	Bibliographic Citation	Must Additional Data Be Submitted Under FIFRA 3(c)(2)(B)?
<u>158.290 Environmental Fate</u>					
<u>DEGRADATION STUDIES-LAB:</u>					
161-1 Hydrolysis	PAIRA	A, B, D, E, G, H	No		Yes
<u>Photodegradation</u>					
161-2 In Water	PAIRA	A, B, D, G	No		Yes
161-3 On Soil	PAIRA	A, G	No		Yes
161-4 In Air	PAIRA	A	No		Reserved ³
<u>METABOLISM STUDIES-LAB:</u>					
162-1 Aerobic Soil	PAIRA	A, B, E, G, H	No		Yes
162-2 Anaerobic Soil	PAIRA	A	No		Yes
162-3 Anaerobic Aquatic	PAIRA	D, G	No		Yes
162-4 Aerobic Aquatic	PAIRA	D	No		Yes
<u>MOBILITY STUDIES:</u>					
163-1 Leaching- Adsorption/ Desorption	PAIRA	A, B, D, E, G, H	No		Yes
163-2 Volatility (Lab)	TEP	A, E	No		Reserved ³
163-3 Volatility (Field)	TEP	A, E	No		Reserved ³
<u>DISSIPATION STUDIES-FIELD:</u>					
164-1 Soil	TEP	A, B, H	No		No ⁴
164-2 Aquatic (Sediment)	TEP	D	No		Yes
164-3 Forestry	TEP	G	No		Yes
164-5	TEP	A	No		Yes

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<u>158.290 Environmental Fate (con't)</u>					
<u>ACCUMULATION STUDIES:</u>					
165-1 Rotational Crops (Confined)	PAIRA	A	No		Yes
165-2 Rotational Crops (Field)	TEP	A	No		Reserved ⁶
165-3 Irrigated Crops	TEP	D	No		Yes
165-4 In Fish	PAIRA	A, B, D, G	No		Yes
165-5 In Aquatic Non-target Organisms	TEP	D, G	No		Yes
<u>158.390 Reentry Protection</u>					
132-1 Foliar Dissipation	TEP	A, B	No		Reserved ⁷
132-1 Soil Dissipation	TEP	A, B	No		Reserved ⁷
133-3 Dermal Exposure	TEP	A, B	No		Reserved ⁷
133-4 Inhalation Exposure	TEP	A, B	No		Reserved ⁷
<u>158.440 Spray Drift</u>					
201-1 Droplet Size Spectrum	TEP	A, B	No		Reserved ⁷
202-1 Drift Field Evaluation	TEP	A, B	No		Reserved ⁷
<u>158.75 Other Exposure Data</u>					
Mixer/loader and applicator exposure data			No		Reserved ⁷
Groundwater Monitoring Data			No		Reserved ⁸

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FOOTNOTES:

1. Composition: TGAI=Technical grade of the active ingredient; PAIRA=Pure active ingredient, radiolabeled; TEP=Typical end-use product.
2. Use Patterns: A=Terrestrial, Food Crop; B=Terrestrial, Non-Food; C=Aquatic, Food Crop; D=Aquatic, Non-Food; E=Greenhouse, Food Crop; F=Greenhouse, Non-Food; G=Forestry; H=Domestic Outdoor; I=Indoor.
3. Data may be required pending receipt of vapor pressure data.
4. Due to the apparent persistence of Methoxychlor, a short-term study is waived in favor of a long-term soil field dissipation study.
5. Data are required due to the apparent persistence under aerobic conditions. A separate study must be performed with a typical end-use product for each registered formulation category. The method of application must include both foliar application and seed treatment. The registrant should submit a protocol for approval before initiating the studies.
6. Data may be required pending the results of the Confined Accumulation in Rotational Crops study.
7. No adequate data exist to fully evaluate the toxicity potential of Methoxychlor. Therefore, this data requirement is reserved pending the results of acceptable toxicology studies.
8. Data may be required pending the results of the required Environmental Fate studies. However, groundwater contamination is likely to be minimal based on the fact that methoxychlor is essentially insoluble in water, sediment-water coefficients (K_d) have been reported at 620, and detection in groundwater has not been reported for nearly 1300 wells that have been sampled in ten states.