

ENDOSULFAN ADDENDUM

Final Report

**Task 2: Environmental Fate and
Exposure Assessment**

Contract No. 68-01-6679

OCTOBER 7, 1985

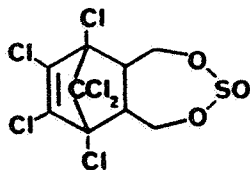
Submitted to:
Environmental Protection Agency
Arlington, VA 22202

Submitted by:
Dynamac Corporation
Enviro Control Division
The Dynamac Building
11140 Rockville Pike
Rockville, MD 20852

Environmental Fate and Exposure Assessment

Endosulfan Addendum

BEOSIT, CHLORTHIEPIN, CRISULFAN, CYCLODAN, DEVISULPHAN,
ENDOCEL, ENDOSOL, ENSURE, FMC 5462, HILDAN, HOEFAN, THIFOR,
THIMUL, THIODAN, THIOFOR, THIONEX, THIOSULFAN, TIOVEL



6,7,8,9,10,10-Hexachloro-1,5,5a,6,9,9a-hexahydro-6,9-methano-
2,4,3-benzodioxathiepin-3-oxide

The data summarized here are scientifically valid but do not meet registration requirements.

5a,9a-Labeled [^{14}C]endosulfan (97.0% pure) at ~3.5 ppm degraded with half-lives of 4-8 and 16-30 days in sandy loam and silt loam soils, respectively (Gildemeister and Jordan, No MRID). Degradates common to both soils included endosulfan sulfate, endosulfan lacton and an unidentified degradate, M4, at respective levels of <45%, 0.2-1.0% and 1.1-4.8%. The ether degradate was found at ~0.02 ppm in two samples of the silt loam soil. Total recovered volatiles were <4% of the applied.

The following represents the data currently required to fully assess the environmental fate and transport of, and the potential exposure to endosulfan based on the data previously reviewed by Dynamac and the EPA for the Endosulfan Standard and data submitted for this addendum: hydrolysis studies; photodegradation studies in water, on soil, and in air; aerobic and anaerobic soil and aerobic and anaerobic aquatic metabolism studies; leaching and adsorption/desorption studies; laboratory and field volatility studies; terrestrial, aquatic, and long-term field dissipation studies; forestry dissipation studies; accumulation studies on rotational crops, irrigated crops, and fish; and reentry studies.

Hydrolysis studies: No data were submitted for this addendum; however, based on previous EPA reviews material balance data are needed for pH 7 at 22° C for each sample taken for the entire length of the study.

Photodegradation studies in water: No data were submitted for this addendum; however, all data are required.

Photodegradation studies on soil: No data were submitted for this addendum; however, based on previous EPA reviews the complete soil characteristics are needed to support the data already submitted.

Photodegradation studies in air: No data were submitted for this addendum; however, all data are required.

Aerobic soil metabolism studies: One study (Gildemeister and Jordan, No MRID) was reviewed and is scientifically valid, but does not fulfill data requirements because the soil moisture content was not maintained at 75% of 0.33 bar, several degradates occurring at >0.01 ppm were not identified, and the pattern of formation and decline of endosulfan sulfate was not established because the test period was too short. All data are required.

Anaerobic soil metabolism studies: One study (Gildemeister, No MRID) was reviewed and is scientifically invalid because the material balances were unacceptably variable and low. Additionally, this study would not fulfill data requirements because the isomeric ratio of the test substance was not reported, and several degradates occurring at >0.01 ppm were not identified. All data are required.

Anaerobic aquatic metabolism studies: No data were submitted for this addendum; however, all data are required.

Aerobic aquatic metabolism studies: No data were submitted for this addendum; however, all data are required.

Leaching and adsorption/desorption studies: No data were submitted for this addendum; however, based on previous EPA reviews adsorption/desorption data are still needed for the soil degradation products of endosulfan.

Data are also needed for the parent compound on a fourth soil type such as clay or clay loam, and for parent and degradates on an aquatic sediment.

Laboratory volatility studies: Data (Gorlitz and Klockner, No MRID) were reported on the vapor pressure of endosulfan. This does not fulfill data requirements because no experimental data were provided to allow an assessment of endosulfan volatility. All data are required.

Field volatility studies: No data were submitted for this addendum; however, all data are required.

Terrestrial field dissipation studies: No data were submitted for this addendum. Based on data submitted for the Endosulfan Standard, additional studies are needed to determine the terrestrial dissipation rate of endosulfan for: 1) field and vegetable crop uses - dust (5% ai), emulsifiable concentrate (34% ai), granular (3% ai), and wettable powder (50% ai); 2) tree fruit and nut crop uses - dust (5% ai), emulsifiable concentrate (34% ai), and wettable powder (50% ai); and 3) domestic outdoor, parks, ornamental, and turf uses - dust (5% ai), emulsifiable concentrate (33.7% ai), and wettable powder (50% ai).

Aquatic field dissipation studies: No data were submitted for this addendum; however, all data are required.

Forestry dissipation studies: No data were submitted for this addendum; however, all data are required.

Dissipation studies for combination products and tank mix uses: No data were submitted for this addendum; however, no data are required because data requirements for combination products and tank mix uses are currently not being imposed for this Standard.

Long-term field dissipation studies: No data were submitted for this addendum; however, all data may be required based on the results of the aerobic soil metabolism and field dissipation studies.

Confined accumulation studies on rotational crops: No data were submitted for this addendum; however, all data are required.

Field accumulation studies on rotational crops: No data were submitted for this addendum; however, all data may be required based on the results of the confined accumulation studies on rotational crops.

Accumulation studies on irrigated crops: No data were submitted for this addendum; however, all data are required.

Laboratory studies of pesticide accumulation in fish: No data were submitted for this addendum; however, all data are required.

Field accumulation studies on aquatic nontarget organisms: No data were submitted for this addendum; however, all data are required.

Reentry studies: No data were submitted for this addendum; however, all data are required.

Label Restrictions

Pending the submission of crop rotation data, it is suggested that crops used for food or feed other than those with registered endosulfan uses be restricted from being planted in endosulfan-treated soil.

References

Gildemeister, H. 1985. Anaerobic soil metabolism study with the insecticide endosulfan. In Endosulfan reregistration: Thiodan technical. Unpublished study received April 19, 1985 under 8340-13; submitted by American Hoechst Corporation, Somerville, NJ. Accession No. 257688. (No MRID)

Gildemeister, H. and H. J. Jordan. 1984. Aerobic soil metabolism study of the insecticide Hoe 002671 (Endosulfan). In Endosulfan reregistration: November 1984 data requirements; Thiodan technical. Unpublished study received January 9, 1985 under 8340-13; submitted by American Hoechst Corporation, Somerville, NJ. Accession No. 256130. (No MRID)

Gorlitz G., and C. Klockner. 1982. Hydrolysis of HOE 02671 (endosulfan). Unpublished study received May 30, 1983 under 8340-13. Submitted by American Hoechst Corporation, Somerville, NJ. Accession No. 250395. (No MRID)