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TASK 5. Development of Chemical/Physical Profile: Thiabendazole

Contract No. 68-01-5830

Final Report

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SUBMITTED TO:

Environmental Protection Agency
Arlington, Virginia 22202

SUBMITTED BY:

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Thiabendazole

1. Aqueous Degradation

Thiabendazole is stable in water with no hydrolysis observed over a 50-day period at pH 3, 6 and 9 and at 25, 35 and 45° C. Photodegradation in aqueous solution is rapid with a half-life of approximately 24 minutes in deionized water and 5 minutes in a 2% acetone solution. Major photodegradation products are benzimidazole, benzimidazole-2-carboxylic acid, benzimidazole-2-carboxamide, 5-hydroxythiabendazole and two unknown compounds. However, photodegradation in soil is slow, with a maximum of 10% degradation after 32 days of exposure.

2. Soil Degradation

Thiabendazole is stable in soil, with half-lives of 279 and 403 days under anaerobic and aerobic conditions, respectively. Thiabendazole at 10 or 20 ppm in a sandy loam soil has no effect on populations of fungi, actinomycetes or algae. However, bacteria are killed at these concentrations, and at 1.0 ppm thiabendazole is slightly inhibitory to bacteria growth. Small amounts of benzimidazole-2-carboximide, which may represent an initial metabolite of thiabendazole, have been found in treated soil.

3. Soil Mobility

Aerobically aged thiabendazole does not leach. It remains in the top 0-3" layer of sandy loam, sand, silty clay loam, and clay soils. Studies also show that photodegraded thiabendazole and its photolytic products do not leach beyond the 3" soil depth.

4. Accumulation

Thiabendazole does not bioaccumulate in catfish. Thiabendazole is not taken up by rotational crops.

References:

1. EPA registration file no. 618-75AA.