ANNEX B

Thiram

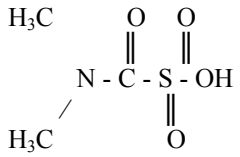
Addendum to the monograph
November 2002

B.8 Environmental fate and behaviour

B.8.1 Route and rate of degradation in soil (Annex IIA 7.1.1; Annex IIIA 9.1.1)

The notifier summarized the data available on the metabolite DCMS and performed a PEC groundwater estimation with the PELMO model.

"Only one degradation product was present in significant quantities. Based on its mass spectrum, the proposed structure for this metabolite was N,N dimethyl cabamosulfonic acid (DMCS):



The concentration of this metabolite peaked at 10.23% on day 16 in the clay soil and declined steadily thereafter. DMCS was itself degraded in all soil types, eventually to CO_2, with DT_{50} of 15 to 38 days.

The percentage DMCS formed under laboratory conditions at 20 °C and the degradation rates are summarised below (Nag and Regis, 2000)

soil type	**% applied dose**	**Time (days)**	**DT_{50} (days)**
sandy loam	9.77	8	15.0
sandy clay loam	5.14	4	37.6
Clay	10.23	16	-

DMCS is not commercially available and has proved impossible to synthesise due to its' instability and polar nature. A description of the extensive efforts undertaken to synthesise DMCS, written by the scientist in charge, Dr. Clifford Pratt, is submitted by Uniroyal Chemical Ltd. (Memo, Pratt C., 2001)"

PELMO estimates of the concentration of DCMS in percolate at 1 meter soil depth using the FOCUS groundwater scenarios (Moyle, 2001)

Software model :

PELMO (version 3.2) was used.

Assumptions :

- DT_{50} DCMS : 37.6 days
- Adsorption coefficent DCMS has been determined by the model SRC PKoc for Microsoft Windows; Koc = 33.45
- application rate for cereal seed treatment : 600 ppm X 175 kg seed/ha is equivalent to 105 g a.s./ha.
- One application every 3 years, 10 days before crop emergence
- Molecular weight conversion factor: Mwt DCMS/Mwt thiram : 153/240.4 = 0.636
- Percentage DCMS formed : 8.38% (mean of 7.77, 5.14 and 10.23%)
- Proportion of applied dose taken up by plant : 40% (results from a study by Womer and Balba on seedling uptake)
- Focus locations sites of Hamburg, Jokioinen, Okehampton, Piacenza

Findings and Conclusions :

Under the assumptions used in the model, the 80th PECgw of the metabolite DCMS were 0.013 µg/l for Hamburg, 0.003 µg/l for Jokioinen, 0.018 µg/l for Okehampton, 0.024 µg/l for Piacenza.

Ecotoxicological relevance

The metabolite DCMS reached its maximum level in the soil laboratory study after 4-16 days. It can be expected that the effects of the metabolites are covered by the studies with the active substance which were realized at the application rate of 2.4 kg a.s./ha : soil microorganisms study of 28 days, earthworm study of 14 days , *Poecilus* and *Aleochara* studies of 28 days (treated seeds planted in artificial soil)

Foliar uses are not expected to lead to DMCS formation based on the results of the soil photolysis study and the low mobility of thiram. Therefore DMCS is not considered of biological or ecological significance.

B.8.4.4 Water/sediment study (Annex IIA 7.2.1.3.2)

The notifier was not able to improve the identification of the unknown metabolites due to technical difficulties. The rapporteur accepted the argumentation that the effects of the metabolites are covered by the mesocosm and the chronic study on fish.

‘ Because some metabolites were not identified in these studies, the Rapporteur Member State requested further work.

It has been the intention of the notifier to identify first the radioactive fractions of the ziram water/sediment study and then to confirm that the metabolites of thiram are the same, because the main metabolite of ziram is thiram as observed in aquatic water/sediment studies with ziram (37-48% after 6h) (Völkl S., 2001[i])

Based on the present ziram study in which 1 of the 3 radioactive fractions was identified, but unfortunately all further attempts to fully identify the radioactive fractions M8 and M9 were unsuccessful and based on discussions with the laboratory RCC, we expect that also for thiram no further progress is possible .

- In a letter of April 13th 2001, the notifier has asked the rapporteur to inform if it is acceptable that we stop the identification work for the thiram water/sediment study without identification of the unknown metabolites, taking into consideration the encountered difficulties and the fact that the toxicity can be assessed without having a full identification.

<u>The levels of the metabolite are not high</u>

“ Only one unknown radioactive fraction (M1) reached a maximum above 10% of the applied radioactivity (river: 20.6% in water and 0.4% in sediment and pond: 19.2% in water and 0.7% in sediment) (1st Amendment to report, 1999 [ii]). It has been demonstrated in a second study[iii] that the very polar fraction contained at least 9 different components (MW1 to MW9). With the exception of MW2[iii], all other fractions reached their maximum value (≤ 8% of the radioactivity applied) before or at day 2 of incubation and decreased until day 10 or were not any more detectable. MW2 was the only fraction, which increased until day 10. “

<u>The metabolite fraction M1 is not stable and degrades in both systems</u>

“ The peak concentration of the unknown fraction occurs on day 4-7 and after 14 days the level decreases steadily in both systems “

<u>The aquatic toxicity of the metabolites is addressed in 2 chronic studies</u>

A mesocosm studied the effect of thiram and its metabolites after a fourfold application. The study has run several months. There is no significant replacement of test water and therefore, all metabolites contribute to

the toxicity in the test system.
A study with rainbow trout studied the sublethal effects of thiram and its metabolites after a fourfold application. This study ran for 42 days. There was no significant replacement of test water and therefore, all metabolites contribute to the toxicity in the test system.

The test period clearly covers the periods where the fractions M1/MW2 were present. “