Thiram

Addendum to the monograph
March 2003

B.9 Ecotoxicology

B.9.2.15 Summary of effects to water organisms - Exposure and risk assessment for aquatic organisms (Annex IIIA 10.2)

The risk assessment for aquatic organisms has been performed for some additional uses (strawberries and ornamentals – field crops).

Table B.9.2.15-1 : Summary of effects of thiram to water organisms – New studies

Test species	**Test system**	**Duration of exposure**	**Results (mg a.s./l)**	**References**
Oncorhynchus mykiss	Static test, a.s.	96 hours	LC_{50} = 0.046 mg a.s./l NOEC = 0.011 mg a.s./l	Peither, 2000
Pimephales promelas	Static test, a.s.	96 hours	LC_{50} = 0.27 mg a.s./l NOEC = 0.10 mg a.s./l	Chole, 1983
Lepomis macrochirus	Static test, a.s.	96 hours	LC_{50} = 0.13 mg a.s./l NOEC = 0.056 mg a.s./l	Forbis, 1983
Oncorhynchus mykiss	Static test, 80WG, 4 applications at 7 day interval Water/ sediment system	42 days	NOEC (42 d, mortality) = 0.020 mg a.s./l NOEC (42 d, growth rate) = **0.012** mg a.s./l	Memmert, 2001
Oncorhynchus mykiss	Static test, 80WG, Water/ sediment system	96 hours, prolonged up to 11 days	LC_{50} = **0.089** mg a.s./l NOEC = 0.020 mg a.s./l	Memmert, 2001
Cyprinus carpio	Semi-static test (daily renewal of test solution), 80WG	96 hours	LC_{50} = 0.200 mg a.s./l	Bossotto, 2001

Exposure of water surface is mainly due to spray drift resulting from foliar application . We assumed that the contribution of other routes of contamination is small in comparison with the drift .

The following assumptions were made to assess the acute risk for water organisms :

- water layer : 30 cm
- Repeated applications were included in the studies. Therefore a.s. degradation has not to be taken into consideration in the TER calculations
- the spray drift scenarios are determined according to Ganzelmeier (2000) :
- application in strawberry (field crop) : 3 applications of 2.5 kg a.s./ha at interval of 7 days
- application in ornamentals (field crop) : 3 applications of 3..2 kg a.s./ha at interval of 7 days
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The risk evaluation has been made with the higher tier data :

- Fish : a static test in presence of sediment allows to investigate the acute effects : LC_{50} : **0.089** mg a.s./l
- Fish : a laboratory study with repeated applications in presence of sediment allows to investigate the long term effects : NOEC (42 days, growth rate) = **0.012** mg a.s./l

- Aquatic invertebrates and algae : a mesocosm has been performed according to the GAP in orchard/vineyard (see addendum September 2000); EAC : 0.020 mg a.s./l, NOEC : 0.001 mg a.s./l (author of the study report); France and Netherlands propose to take an EAC of **0.010** mg a.s./l.

Conclusion :
The previous risk assessment had shown that the risk to aquatic organisms in vineyard was acceptable with the normal mitigations measures (buffer zones). The risk in orchard was acceptable if additional mitigation measures were applied (buffer zones, hedges, …) (addendum November 2002)
The risk assessment for aquatic organisms has been performed for some additional uses (strawberries and ornamentals – field crops). The risk to fish after repeated applications and the risk to aquatic invertebrates and algae is acceptable when mitigation measures such as buffer zones are applied.

We did not use in this first tier assessment the possibility of reduced trigger values when several test species are available (fish). This type of assessment could be made at MS level and would lead to less severe mitigation measures.

Table B.9.2.15-2 : TER related to the application in strawberry (field crop) : 3 applications of 2.5 kg a.s./ha at interval of 7 days

Toxicity exposure ratios for aquatic organisms				
Appl. rate (g a.s./ha)	Organism	Distance	TER	Annex VI trigger
2500	LC50 fish, in presence of sediment = 0.089 mg a.s./l	0	**0.1**	100
		1	**4.0**	100
		2	**6.7**	100
		3	**10.7**	100
		4	**11.9**	100
		5	**18.7**	100
		10	**36.8**	100
		20	**71.2**	100
		30	106.8	100
2500	NOEC fish study with repeated applications = 0.012 mg a.s./l	0	**0.0**	10
		1	**0.5**	10
		2	**0.9**	10
		3	**1.4**	10
		4	**1.6**	10
		5	**2.5**	10
		10	**5.0**	10
		20	**9.6**	10
		30	14.4	10
2500	EAC Mesocosm = 0.010 mg a.s./l	0	**0.0**	3
		1	**0.4**	3
		2	**0.8**	3
		3	**1.2**	3
		4	**1.3**	3
		5	**2.1**	3
		10	4.1	3
		20	8.0	3
		30	12.0	3

Table B.9.2.15-2 : TER related to the application in ornamentals (field crop) : 3 applications of 3.2 kg a.s./ha at interval of 7 days

Toxicity exposure ratios for aquatic organisms				
Appl. rate (g a.s./ha)	Organism	Distance	TER	Annex VI trigger
3200	LC50 fish, in presence of sediment = 0.089 mg a.s./l	0	**0.1**	100
		1	**3.1**	100

		2	**5.2**	100
		3	**8.3**	100
		4	**9.3**	100
		5	**14.6**	100
		10	**28.8**	100
		20	**55.6**	100
		30	**83.4**	100
3200	NOEC fish study with repeated applications = 0.012 mg a.s./l	0	**0.0**	10
		1	**0.4**	10
		2	**0.7**	10
		3	**1.1**	10
		4	**1.3**	10
		5	**2.0**	10
		10	**3.9**	10
		20	**7.5**	10
		30	11.3	10
3200	EAC Mesocosm = 0.010 mg a.s./l	0	**0.0**	3
		1	**0.3**	3
		2	**0.6**	3
		3	**0.9**	3
		4	**1.0**	3
		5	**1.6**	3
		10	3.2	3
		20	6.3	3
		30	9.4	3