

Exposure assessment in surface waters for the aquatic risk assessment of pesticides

Theme: Risk assessment procedures for pesticide registration

BO-06-010-002

Problem

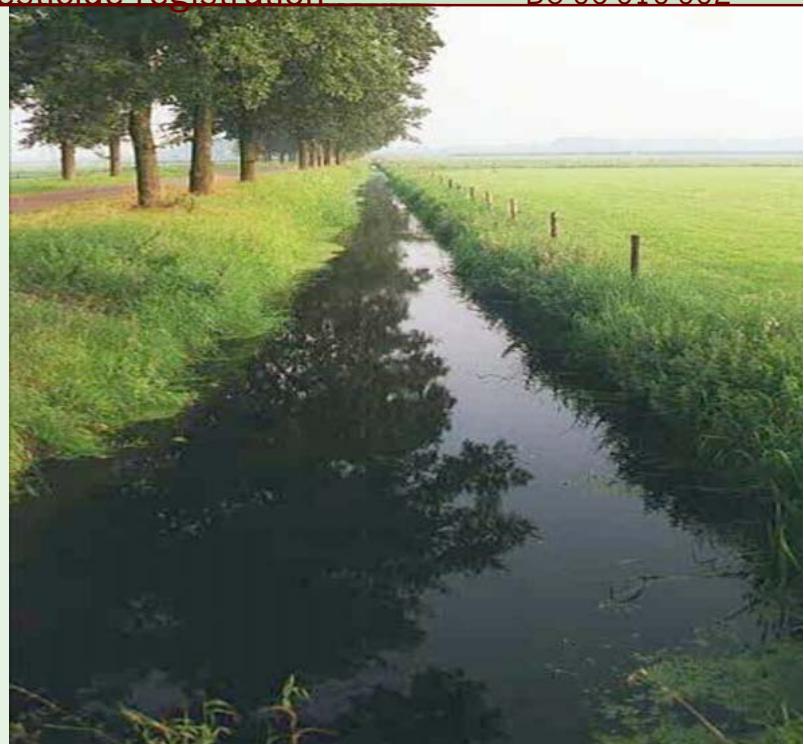
The TOXSWA model is used in the pesticide registration procedures in The Netherlands and at EU level to assess the risks of pesticides for aquatic ecosystems. Until now the extent to which the TOXSWA model can be used to obtain reliable exposure concentrations in small surface waters, is unknown.

Approach

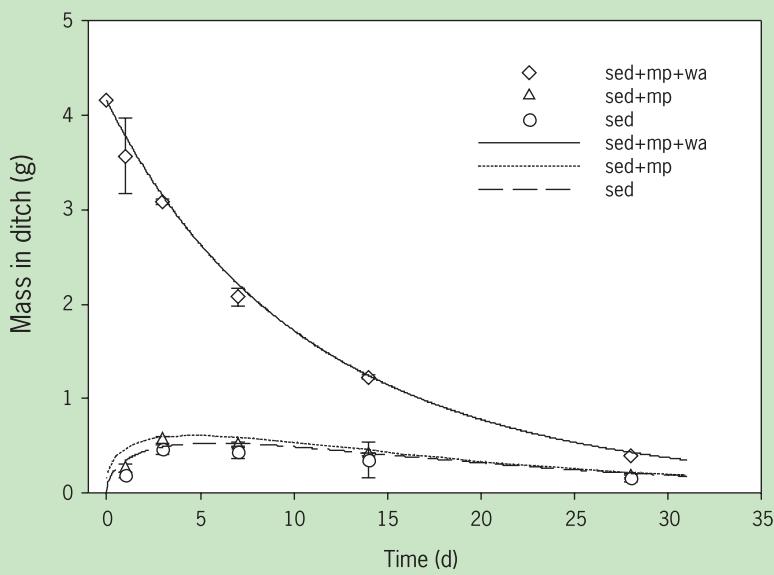
The TOXSWA model is tested against data obtained from a field experiment to assess how well the model can calculate the behaviour of pesticides in real-world waterbodies. The main characteristics of this test were:

- Application of herbicide to a stagnant outdoor ditch
- Derivation of substance properties from laboratory tests
- Comparison of computed concentrations and distributions with the measurements in the ditch

The input parameters for degradation in water and sorption to sediment were calibrated within realistic ranges for the field experiment.



Distribution



Distribution of a herbicide between the water (wa), sediment (sed) and macrophytes (mp) in an outdoor ditch, measured (symbols) and simulated (lines) by the TOXSWA model.

Results

The distribution of the herbicide between the water, sediment and the water plants calculated by the TOXSWA model agreed well with the measurements. Further, the calculated concentrations in the water and sediment compartments also agreed with the measurements.

Future use in risk assessment

Field tests of the TOXSWA model provide insight in the quality of the assessment of the fate of pesticide in surface waters. We aim to increase confidence in the existing pesticide registration procedure by testing the model against data from field tests.

Communication 2008

The test of the TOXSWA model will be submitted for publication in a peer-reviewed journal in 2008.

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