An ecosystem services approach to pesticide risk assessment and risk management of non-target terrestrial plants: recommendations from two SETAC Europe workshops

Gertie H.P. Arts¹, Lorraine Malty², Margit Dollinger³, Eva Kohlschmidt³, Christoph Mayer¹, Giovanna Meregoalli⁴, Hugo Ochoa-Acuña⁵, Véronique Poulsen⁶
¹ Alterra WUR, The Netherlands; ² The University of Sheffield, United Kingdom; ³ BayerCropscience, Germany; ⁴ Agroscope, Switzerland; ⁵ BASF, Germany; ⁶ Dow AgroSciences, Italy; ⁷ DuPont Crop Protection, United States; ⁸ ANSES, France.
E-mail contact: Gertie.Arts@wur.nl

SETAC endorsed workshop description and proposed higher-tier options

**Background**
Registration of Plant Protection Products (PPP) in the EU is under Regulation 1107/2009, which recommends a tiered approach to assessing the risk to non-target terrestrial plants (NTTPs). However, little information is provided on how to perform and implement higher tier studies or how to use them to refine the risk assessments. Two SETAC endorsed workshops were organized with sponsorship from the European Crop Protection Association, the Dutch Ministry of Economic Affairs and participating stakeholder representatives.

**Higher tier options for NTTPs**

<table>
<thead>
<tr>
<th>Tier</th>
<th>Description</th>
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<tbody>
<tr>
<td>1</td>
<td>Simple (few data)</td>
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<tr>
<td>2</td>
<td>Tests with additional species / refined exposure test</td>
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<tr>
<td>3</td>
<td>Population and community level experiments and models</td>
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<tr>
<td>4</td>
<td>Field studies and landscape level models</td>
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**Overall Workshop Aims**
Two workshops (April 2014, Sept 2015) with the aim of:
- Developing a framework for a higher-tier approach for assessing the risk of plant protection products to non-target terrestrial plants (NTTP) in off-crop areas
- Providing expert opinion and advice as input for the ongoing revision of the terrestrial ecotoxicology guideline document and NTTP risk assessment procedures.

**Input workshop 2**

**Charge questions of workshop 2**
1. How to address reproductive effects in the Risk Assessment for non-target terrestrial plants (NTTPs)?
2. How to conduct higher tier tests (field studies) for NTTPs and what options are available?
3. How to mitigate risks for NTTPs?

**Workshop participants workshop 2**
(from academia, business and government)

**Agreed recommendations**

**Effects on reproduction**
Surrogate endpoints of the long-term impact of PPP on vascular plant reproduction are flowering, seed production and seed germination. Preliminary comparative analysis of reproductive and vegetative endpoints indicates that the reproductive endpoints (mainly seed number and seed biomass) are on average less than a factor of 2 more sensitive than the vegetative endpoints (vegetative vigour, biomass) when comparing the same point estimate (i.e. EC10 or EC50). This conclusion was independent of whether the analysis was based on data collated by EFSA (EFSA, 2014) or on an extended dataset containing published and unpublished information (Christl, 2015).

**Lower and higher tier testing**
Based on an initial analysis of wild versus crop species (Christl, 2015), testing with standard crop species appears to be appropriate for risk assessment of wild species. There is a need for criteria to evaluate and interpret field studies in the context of SPGs.

**Mitigation**
Mitigation measures described in MaSPiE are appropriate for non-target terrestrial plants.
Risk assessment indicates what proportion of risk reduction is required, but how to achieve this (i.e. implementation) is up to individual MS (using the toolbox from MaSPiE).

**Compensation**
Compensation for in-crop effects should be defined by risk managers in the light of the specific protection goals. Several pieces of legislation may be relevant when considering compensation (e.g. sustainable use directive; CAP; habitat directive).

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