Further developments in the risk assessment of pesticides to non-target terrestrial plants

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Introduction

In view of the publication and entry into force of the new Regulation (EC) 1107/2009 and the revised data requirements for chemical PPPs (EC Regulation 283/2013 and 284/2013), as well as new scientific findings, the Panel on Plant Protection Products and their Residues (PPR) was asked to revise the Guidance Document on Terrestrial Ecotoxicology [1]. It was decided to split the task and to address individually the risk assessment for separate organism groups, i.e. in-soil organisms, non-target arthropods, amphibians and reptiles, and for non-target terrestrial plants (NTTPs).

The Opinion on the state of the science for the risk assessment for NTTPs was issued in 2014 [2]. The overall protection goal for higher terrestrial plants is to maintain biodiversity of plant species in the agricultural area, including both the above- and below ground (seed bank) diversity, and is linked to ecosystem services.

Methodological approach of the EFSA PPR Opinion

Specific Protection Goals were defined:

- for off-field NTTPs as key drivers for nutrient cycling, water regulation, food web support, aesthetic values and genetic resources (biodiversity) (see Table 1);
- for in-field NTTPs as key drivers for food web support (primary production, provision of habitat and food, etc.) (see Table 2) and aesthetic values and genetic resources;
- for endangered species.

In current test guidelines, plants are tested only at the seedling/juvenile stage. However, effects can be observed on either the vegetative or the reproductive parts. A number of test endpoints which can be derived directly from standard tests with several species are proposed for the risk assessment of NTTPs:

- Reproductive endpoint: based on the 5th percentile of distribution of effect rate (ERrepro10) values;
- Biomass endpoint: one based on ERveg50 values, one based on ERveg10 values. Both the 5th percentiles of their respective distributions;
- Visual endpoint (e.g. chlorosis or bleaching): based on a 5th percentile of the distribution of ERvisual50 values;

If reproductive data are not available, to derive the (ER)repro10, the 5th percentile of the ERveg10 (when available) or the ERveg50 should be used in combination with a suitable extrapolation factor (EF). The EFs used to extrapolate from vegetative to reproductive endpoints and calculated with a 95 % confidence are 3 (ERveg10) and 35 (ERveg50), respectively.

Table 1. Off-field NTTPs as key drivers for nutrient cycling, water regulation, food web support, aesthetic values and genetic resources (biodiversity)

<table>
<thead>
<tr>
<th>Ecological entity</th>
<th>Attribute</th>
<th>Magnitude</th>
<th>Temporal scale</th>
<th>Spatial scale</th>
<th>Degree of certainty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual-population/group</td>
<td>behavior-survival/growth/reproduction/abundance/biomass-process-biodiversity</td>
<td>Negligible effect</td>
<td>Days-weeks-months-season-year</td>
<td>Field/landscape</td>
<td>High</td>
</tr>
</tbody>
</table>

Table 2. In-field NTTPs as key drivers for food web support (e.g. primary production, provision of habitat and food)

<table>
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<th>Ecological entity</th>
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References and Acknowledgments


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