

4.10 A review of available bumble bee colony end-points and identification of current knowledge gaps

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Abstract

Bumble bee adult chronic toxicity studies and bioassays to assess larval development in the laboratory are currently undergoing method validation and standardization through ring-testing. These test designs will contribute valuable data required for Tier 1 risk assessments for this significant and commercially valuable pollinator. While laboratory assays allow for a conservative, highly controlled, and standardized evaluation of the relationship between test item dose and organism response, they do not reflect field-realistic exposure scenarios and cannot adequately address potential impacts on whole colony development.

Semi-field, landscape-level field, or feeding studies are more suitable to describe whole- colony health and development and potential impacts from pesticide exposure in an agricultural setting. However, evaluation end-points need to be clearly characterized and the associated assessment methodology should minimize variation across studies. This is especially true for field studies, where genetic and environmental variability will cause significant impacts on study results.

Here, we seek to provide a comprehensive review of available bumble bee colony end-points, assess their relevance and suitability for higher tier studies examining field-realistic exposure scenarios, and identify data, method, and knowledge gaps that may guide future research activity.

4.11 Non-*Apis* (*Bombus terrestris*) versus honeybee (*Apis mellifera*) acute oral and contact sensitivity – Preliminary results of ECPA company data evaluation

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Abstract

A preliminary data evaluation was conducted by ECPA companies to compare the sensitivity of bumblebees (*Bombus terrestris*) with the sensitivity of honeybees (*Apis mellifera*). For the evaluation about 70 data sets were available for contact exposure and about 50 data sets for oral exposure. The data sets comprised insecticides, fungicides, herbicides in about equal numbers plus a few other substances. The preliminary ECPA company data evaluation of LD₅₀ values indicates lower or similar contact sensitivity of bumblebees vs. honeybees. Similarly, lower or similar oral sensitivity of bumblebees vs. honeybees was determined with one exception for an insecticide that indicated higher acute oral bumblebee sensitivity compared to honeybees. For this insecticide, higher tier data indicates no negative impact on bumblebees at the maximum intended use rate. Overall, the ECPA company data evaluation indicates that bumblebees are not more sensitive than honeybees based on acute toxicity assessment.

Keywords: Honeybee, bumblebee, acute oral and contact sensitivity

Introduction

The knowledge regarding the honeybee sensitivity versus the sensitivity of other bee species to plant protection products is currently limited^{1, 2, 3}. A preliminary data evaluation was conducted by ECPA companies to compare the sensitivity of bumblebees (*Bombus terrestris*) with the sensitivity of honeybees (*Apis mellifera*).