

Risk assessment of bees from the use of biocides – exposure assessment

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Introduction

The ECHA bee guidance¹, covers the risk assessment for chemical biocidal substances, applied in or reaching the environment through outdoor spraying, application of manure/sludge from animal housings, and irrigation (Figure 1). The methodology is largely aligned with the revised EFSA bee guidance for pesticides². Predicted Exposure Quantities (PEQ) derived in exposure assessment are subsequently used in a 'combined risk assessment' to obtain predicted effect at the colony/population level.

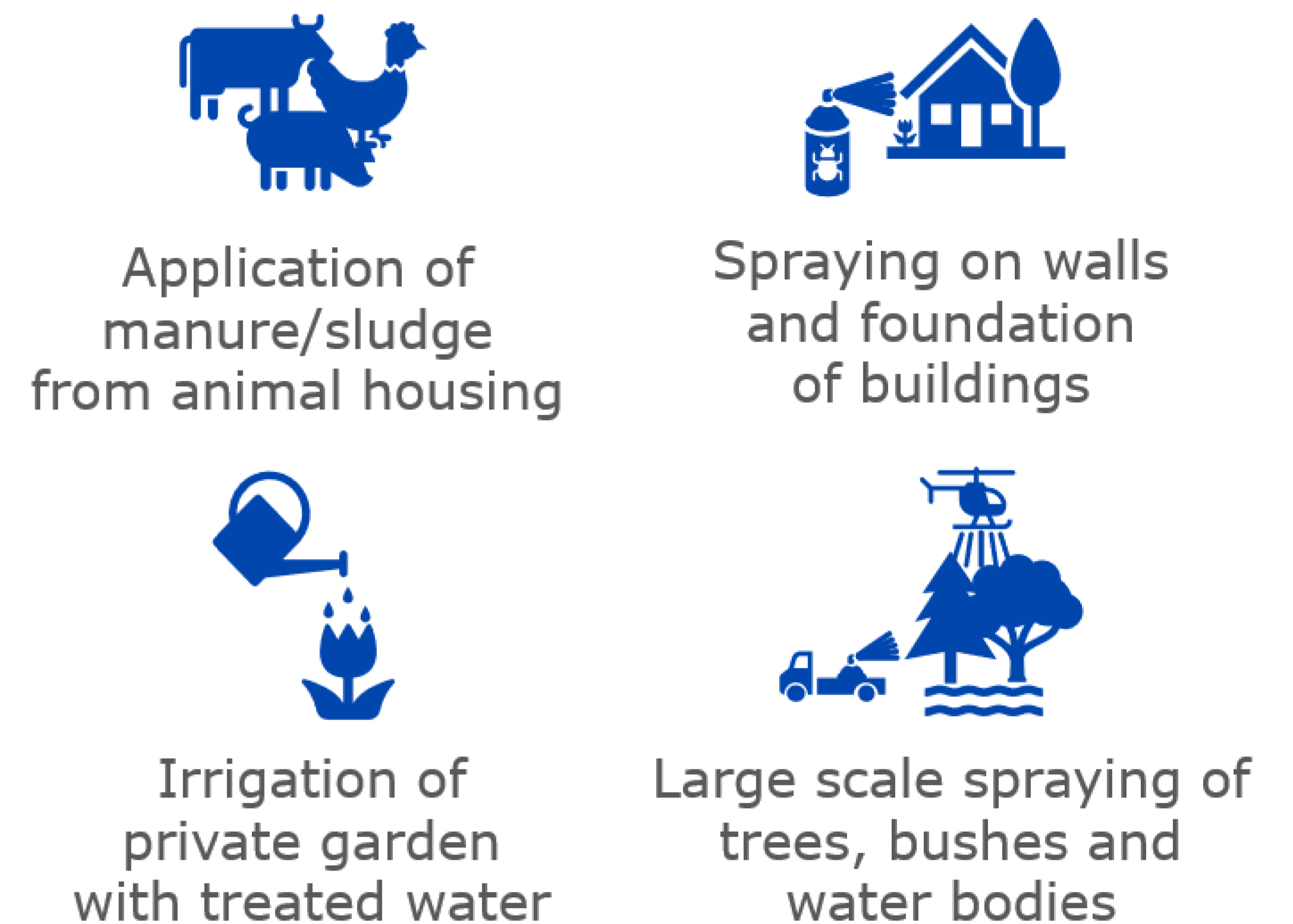


Figure 1. Relevant sources of exposure from the use of biocides (Product Type 18)

Exposure assessment from the use of biocides

To identify sources of exposure with relevance for bees, biocides emission scenarios were screened considering the following criteria:

- outdoor release,
- release pathway,
- release scale magnitude, and
- insecticidal mode of action.

Different sources of exposure are assessed by one or more bee exposure scenarios. The considered routes of bee exposure are contact and dietary (Figure 2). The mathematical models, as presented in the EFSA bee guidance, are applied in the biocide assessment to calculate PEQs for four risk cases:

- Acute-contact risk
- Acute-dietary risk
- Chronic-dietary risk
- Larvae-dietary risk.

Conclusions

- Emissions from active substances used as insecticides, acaricides and products to control other arthropods (PT18) have potential exposure to bees significant enough to warrant an exposure assessment
- The guidance provides a tiered approach to estimate exposure of bees (Figure 3), when biocidal products are intentionally applied outdoors, or if matrices unintentionally contaminated with biocides are released to the outdoor environment.

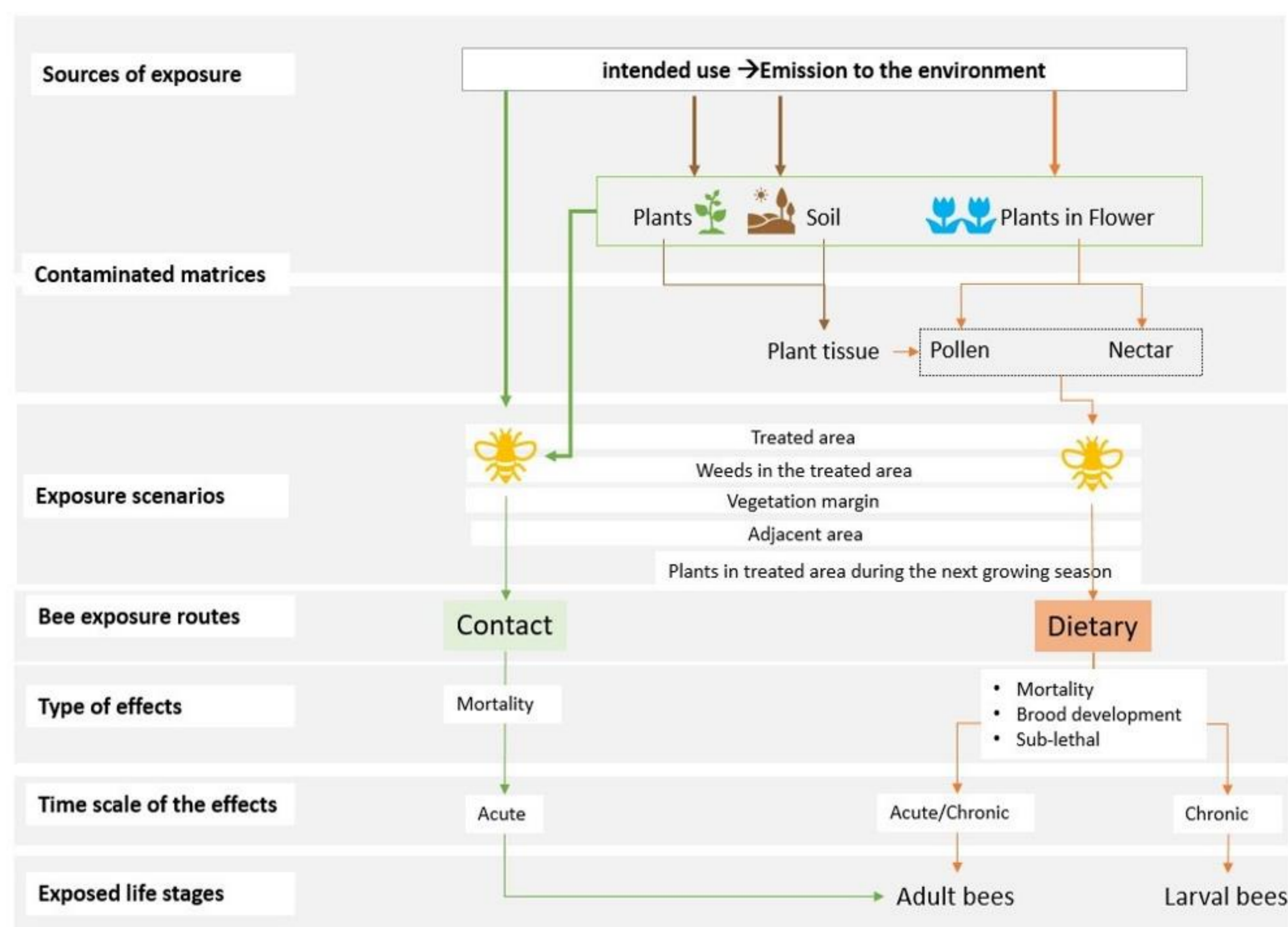


Figure 2. Overview of biocide exposure to bees

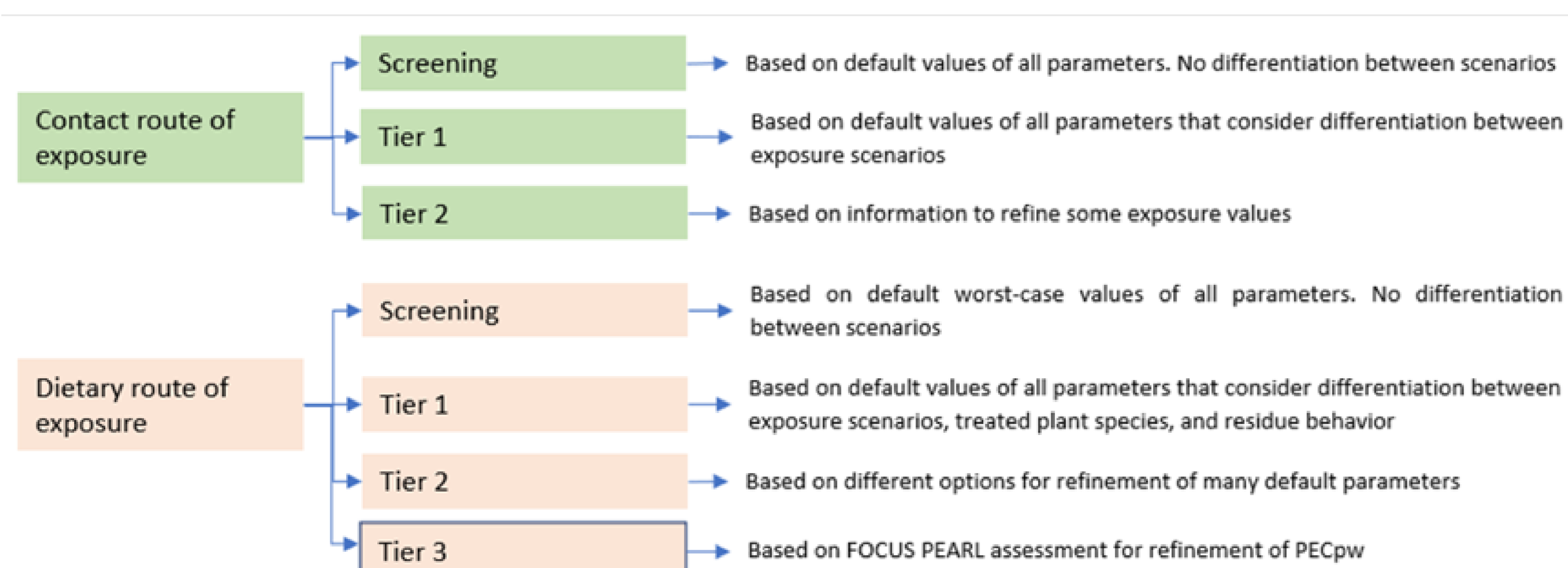


Figure 3. Tiered approach for exposure assessment

FOCUS PEARL = a one-dimensional numerical model of plant protection product behaviour in the soil-plant system applied for biocides
PECpw = predicted environmental concentration in soil porewater

References

¹ECHA. 2024. Guidance on the assessment of risks to bees from the use of biocides.

²EFSA. 2023. Revised guidance on the risk assessment of plant protection products on bees (*Apis mellifera*, *Bombus* spp. and solitary bees).