4.19 Method development of a semi-field study using micro-tunnels with the solitary bee species *Osmia bicornis*

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Abstract

Worldwide declines in honey bees and other native and managed pollinators have led to an increased global dialogue about the different aspects concerning the potential factors that may be causing these declines. One important factor under consideration is the use of pesticides and the understanding of how plant protection products are affecting the non-target insect group of pollinators *Apoidea* (Fischer, 2011). By now there have been recent developments in toxicity testing of plant protection products on honeybees and their brood and there are several test guidelines available for studying the potential impacts of pesticides on the honeybee *Apis mellifera* (e.g. OECD 213, 214, 237, 75 or EPPO 170).

In contrast to these guidelines there are no validated test procedures developed for native (non-*Apis*) bees like solitary bee species, stingless species or other social non-*Apis* bees. These groups of bees are as important for pollinating as honeybees. Furthermore, the biology and ecology of non-*Apis* bees differs from honeybees in several ways, including the body size, foraging behavior or in particular the nesting behavior.

Therefore, a method development for a semi-field study was planned and conducted. As test species the solitary (over Europe and North Africa widespread) bee species *Osmia bicornis,* the red mason bee, was used. Semi-field tests are especially important because they are designed to monitor sub-lethal effects on nesting behavior, reproduction performance or foraging behavior caused by pesticides. Furthermore, semi-field scenarios (higher tier) may provide a more realistic exposure scenario under controlled and defined conditions (crop, tunnel size and exposure duration). Therefore, the results from a semi-field test potentially provide data for a more realistic, worst-case prediction of exposure of limited duration under semi-field conditions. The method development of the semi-field study took place in four 'micro' tents of 4.60 m^2. White mustard *Sinapis alba* and the scorpionweed *Phacelia tanacetifolia* was used as forage crop to provide pollen and nectar for the bees. The results of this method development have been presented in a poster.

References

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