# Section 3 – Semi-field and field testing methodologies

## 3.1 Which endpoints can reliably be assessed in semi-field and field pollinator species testing without estimating false positive or false negative? MDD's and replicates issue

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### Abstract

Statistical power, number of replicates and experiment complexity of semi-field and field *Apis* and non-*Apis* bee species studies has become a major issue since the publication of the not yet adopted EFSA Guidance on the risk assessment of plant protection products on bees (*Apis mellifera*, *Bombus* spp. and solitary bees) (EFSA 2014). According to the guidance document, field studies have to be designed such as to be able to detect significance differences as low as 7% for certain endpoint as reduction in colony size. An analysis presented by Miles (2013) at a special SETAC symposium on Pesticide Risk for Pollinators, showed that to be able to detect such a small difference of 7% in honeybee field studies, 28 Fields 4 km apart with a total of 186 colonies (7 colonies/field) would be required. This is obviously not feasible.

So we decided to analyse key endpoints such as Termination Rate and Number of Brood Cells in honeybee studies, Cocoon Production and Flight Activity in Osmia studies and Number of Queens in bumble bee studies (just to mention some of the endpoints considered) in all the many semi-field and field studies we performed with *Apis mellifera, Bombus terrestris and Osmia sp*. in the past years. We show that there are big differences in the MDDs depending on endpoint and species tested. Moreover, interpretation of results depends extremely on the scale used to assess and interpret the MDDs, e.g. the scale proposed for bumble bees or the MDDs and effect classes that can be detected used in aquatic studies proposed by the EFSA in 2013 (Brock *et al.*, 2015) which seems to be a much more realistic approach. We will also discuss if the "perfect sample size" really exists and how we think the MDDs classification should be done in future when semi-field and field bee studies are evaluated.

### References

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