

## Solitary Bee & Bumble Bee Semi Field And Field

### Welcome To Eurofins Agrosience Services

Eurofins Agrosience Services offers solitary bee and bumble bee studies following tailor made designs adapted to specific crops and requirements. All studies are planned and performed by a highly experienced team of scientists and technical personnel. The solitary bee studies are performed with red mason bees (*Osmia bicornis* L.) under semi-field and field conditions. Bumble bee studies with *Bombus terrestris* L. can be conducted as semi-field studies, as field studies but also under greenhouse conditions in Spain and Italy/Sicily.

Special study designs include long-term studies with over-wintering, studies in the relevant crop (e.g. sunflower, citrus, melon, cucumber, zucchini, sweet pepper, tomato, maize, nectarine, peach, apple) where the product comes into its use and residue studies with solitary and bumble bees.

### Semi-field Studies with Solitary Bees

The crop area covered by each tunnel tent is approximately 60 m<sup>2</sup> with at least one nesting unit placed in each tunnel. In such studies, the solitary bee exposure to a treated crop is checked under comparable conditions for the different treatment groups within one test. The crop used is either a bee attractive crop such as *Phacelia*, oil seed rape or the relevant crop. The endpoints bee flight activity, nest occupation, cell production and cocoon production are assessed. After overwintering the cocoons, hatching success and vigour of offspring can be observed.



### Solitary Bee Field Studies

Fields of at least 2 ha are used for field studies. In each field, four to twelve nesting units of up to 200 cavities each are set-up for further assessment. The crop used is either a bee attractive crop such as *Phacelia*, oil seed rape or the relevant crop.

The endpoints bee flight activity, foraging activity, nest occupation, cell production, cocoon production and parasitism rate are assessed. The hatching success and vigour of produced offspring can be observed.

### Portfolio Solitary Bee Studies

- Semi-field studies and field studies
- Different crops
- Different solitary bee species (*Osmia cornuta*, *Megachile rotundata*, etc.)
- Overwintering of cocoons and assessment of hatching rate
- Offspring vigour assessment
- Pollen source identification
- Protein content determination in pollen
- Residue analysis of solitary bee pollen mass

### Bumble Bee Greenhouse Studies

Eurofins Agrosience Services performs semi-field studies with bumble bees (*Bombus terrestris* L.) in commercial greenhouses. The objective of these studies is to evaluate the side effects of the test item after application during the flowering period and high activity of bumble-bees. In situations where residual effects are expected, bumble bees can be introduced following a waiting period after the application. Test items can be applied by drip irrigation system and / or by foliar application. Besides the endpoints of flight activity, foraging activity, mortality and hive development also the brood development and the reproduction success is assessed.

### Bumble Bee Semi-Field Studies

Semi-field studies are performed either in bee attractive crops like *Phacelia* or oil seed rape or in the relevant crop like potato etc. The tunnel size should be large enough to provide enough food resources for the hive development.

Typical endpoints are the flight activity, foraging activity, mortality in the hives and in the tunnels, hive development, brood development and reproduction success.

### Bumble Bee Field Studies

As bumble bees play also an important role as pollinators in natural landscapes, field studies are performed either in bee attractive crops like *Phacelia* or oil seed rape or in the relevant crop like potato etc.

Typical endpoints are the flight activity, foraging activity, mortality, hive development, brood development and the reproduction success.

### Special Skills

- Dust application (semi-field and field studies)
- Studies from seeding to flowering (dust, guttation, flowering)
- Residue studies with different crops (e.g. oilseed rape, maize, melon, cucumber, zucchini, pepper, apple, peach, citrus) under semi-field and field conditions.
- Samples from the hives or cavities (e.g. nectar, pollen, pollen mass and wax) as well as forager bees collected in front of the hives or cavities and samples from the crop can be taken (nectar and pollen from single flowers)

### Industry partnerships

- LAVES Institut für Bienenkunde, Celle
- Länderinstitut für Bienenkunde, Hohen-Neuendorf
- Long-term cooperation with local farmers
- Participations, Memberships; Contacts (e.g. AG Bienenschutz, ICPBR)

### Eurofins Agrosience Services Is Part Of Eurofins Scientific; A Leading Provider Of Analytical Services.

The Agrosience Group offers unparalleled expertise to the crop protection industry; with over 750 staff globally and more than 80 fully owned facilities across 25 countries, we are committed to developing and growing in order to meet the needs of the Agrosience industry.

## Eurofins Agrosience Services Group

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