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## Section 4 – Risk Assessment/Risk management

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### 4.1 Risk of exposure in soil and sublethal effects of systemic insecticides on ground-nesting hoary squash bees

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#### Abstract

Ground-nesting solitary bees comprise 70% of bee species in temperate climates. In these species, female bees contact relatively large amounts of soil as they excavate their nests. Using the hoary squash bee (*Peponapis pruinosa*) as a model species, we evaluated the risk to adult female ground-nesting bees of exposure to lethal doses of systemic insecticide residues (clothianidin, thiamethoxam, imidacloprid, chlorantraniliprole) in agricultural soil in Ontario, Canada. To do this, we gathered agricultural soil samples at biologically relevant depths both during the bee-active period (July/August) and before insecticide application was made. Samples were analyzed for insecticide residues, and the residue concentrations were fitted to a distribution curve relating concentration to probability of exposure. Three LD50 benchmarks were then applied to the distribution curve to determine the probability of exceeding these benchmarks. Our assessment demonstrated high risk to ground-nesting bees, of exposure to lethal doses of clothianidin, thiamethoxam, and imidacloprid residues in agricultural soil based on the hoary squash bee model. No exposure risk was found for chlorantraniliprole. In parallel to our risk assessment, we introduced mated adult female hoary squash bees into net-covered hoop-houses in which a squash crop had been treated with imidacloprid, thiamethoxam, or chlorantraniliprole or not treated to evaluate the effects of exposure to these insecticides on nest establishment, reproduction, and pollen harvest. Statistically significant sublethal effects on pollen harvest, nest establishment, and reproduction were found for bees exposed to imidacloprid-treated squash plants with no effects found for bees exposed to squash plants treated with thiamethoxam or chlorantraniliprole.

### 4.2 Biopesticides and Pollinators – Examples and requirements on risk assessment from a technical perspective

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#### Abstract

Biopesticides such as plant extracts or microbial compounds are currently the fastest growing segment of the crop protection industry, making the need for a more structured and efficient risk assessment undisputable. Regulators and relevant authorities have started to work on binding documents and set requirements, but yet, navigating the regulatory pathway is still a challenge. Requirements differ around the globe. As an example, in Europe, Biopesticides are treated similar to conventional plant protection products; whereas, in the US a separate set of requirements and partly also risk assessment is set up.

This presentation intends to show current legislative background and guidelines in place when it comes to risk assessment for pollinators concerning biopesticides. Further on some examples from the daily laboratory routine as well as differences between standard approaches for conventional plant protection products versus biopesticides are shown. Overall the need for a differentiated approach as well as adapted mechanisms and testing strategies for special type of biologically active compounds shall be discussed.