

Why are fipronil uses safe to bees?

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In this presentation, an overview about the bee related data of fipronil and its uses is given. Consideration of all the data as well as some general aspects on the issue lead to the clear conclusion that fipronil cannot be the cause of the increased bee mortality.

Fate of systemic insecticides in fields (imidacloprid and fipronil) and risks for pollinators

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Imidacloprid binds nicotinic ACh receptors. The vital functions of bees are affected by sublethal levels of imidacloprid from 2 to 20 $\mu\text{g}/\text{kg}$ in the feeding source. Chronic mortality (50%) was observed at 0.1 $\mu\text{g}/\text{kg}$. We developed a LC/MS-MS methodology for plants and pollens (LOQ:1 $\mu\text{g}/\text{kg}$) according to GLP and directive 96/23 EC.

Our results show that imidacloprid (Gaucho seed dressing) diffuses in sunflowers and maize with an ascent at the flowering. Here, average levels are 5-8 $\mu\text{g}/\text{kg}$ in flowers and 2-3 $\mu\text{g}/\text{kg}$ in pollens. PEC/PNEC, calculated from the consumption of pollen by bees, is then in the range of 20-30 when considering the loss of feeding activity. PEC/PNEC is 700-800 when considering the chronic mortality after 11 days. The ratio further increases when considering also the contamination of nectar (1.9 $\mu\text{g}/\text{kg}$). Gaucho on sunflower has been suspended in France since 1999. A new evaluation for maize is in progress.

Fipronil is another systemic insecticide acting on GABA regulated receptors. It induces significant mortality of bees from 0.01 $\mu\text{g}/\text{kg}$, while sublethal effects were observed at the $\mu\text{g}/\text{kg}$ level. We developed a GC/MS method for pollens with a LOD at 0.02 $\mu\text{g}/\text{kg}$ and a LOQ at 0.2 $\mu\text{g}/\text{kg}$. The results indicate clearly that fipronil and its metabolites can reach the pollen of sunflower and maize due to the Regent TS formulation. This insecticide has been suspended in France in 2004.

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