Study evaluating insecticide's impact on honeybees called into question

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In “Effects of a Neonicotinoid Pesticide on Honey Bee Colonies:A Response to the Field Study by [Edward] Pilling et al. (2013),” a research team headed by Peter Hoppe questions findings that thiamethoxam, a systemic insecticide in the class of neonicotinoids, had no reported effects on honeybee colony survival and overwintering success.

Pilling, Peter Campbell, Mike Coulson, Natalie Ruddle and Ingo Tornier concluded in a 2013 paper that “dietary exposure to neonicotinoids present in trace levels in pollen and nectar cannot be implicated in honey bee declines, but that gaps remain in our current knowledge.”

Hoppe's team critiqued the paper in 2015, arguing that the study had some “major deficiencies.”

“Our assessment of the multi-year overwintering study ... revealed a number of major deficiencies regarding the study design, the protocol and the evaluation of results,” Hoppe said. “Colonies were exposed for short periods per year to flowering oilseed rape and maize grown from thiamethoxam-coated seeds. Thiamethoxam as the sole active ingredient was used, not a more efficacious commercial product, at seed treatment rates that were lower than recommended as per common agricultural practices.”

Syngenta, a Swiss global leader in agrochemical production, took a proactive position in response to the request for increased transparency in the industry and published the honeybee field studies supporting the safety of thiamethoxam.

Three Syngenta employees and two additional experts conducted the field studies that included 12 individual pollen and nuclear field residue trials and five long-term field effects studies on honeybees in four locations in France.

Great precautions were taken to avoid the presence of other confounding factors, such as exposure to other insecticides. In addition, such studies are legally required to comply with the strict requirements of Good Laboratory Practice and international guidelines.

After the extensive studies, the authors found that many factors may have contributed to the decline in health, including the spread of parasites and pathogens, reduction in available forage, beekeeping management practices, migration of colonies, and weather and climate change.

One of the criticisms brought up in the review of the paper was that technical thiamethoxam was used instead of the commercial product during the field studies. Pilling's team said the claim was not true and that the paper clearly stated that formulated commercial products were used, which also included fungicides. The authors also disputed the claim that there was a failure to quantify colony losses in winter.

As far as claims that the study was carried out at a lower application rate than the maximum recommended application rate, Pilling's researchers argued that they used current seeding rates in Europe.

“Pilling et al.’s study was designed to only address the pre-dominant commercial rates that were most commonly used in Europe for these crops,” the authors wrote. “The higher hectare rates registered in few E.U. countries at the time of the EFSA review, which exceeded the rates tested in the studies described, ... were predominantly the result of outdated old seeding rates and not in line with current realistic seeding rates in Europe.”

Other claims Hoppe's team made against the study included that the window of exposure was too short and “not field relevant”; that keeping the colonies in woodland sites “without intensive agricultural crops” did not reflect normal beekeeping practice; and the lack of data reported for colony losses during the winter.

Pilling's team disputed each claim, saying the “alleged deficiencies” could have easily been clarified.

“We contend that the alleged deficiencies claimed by Hoppe et al. to undermine the conclusions of Pilling et al. are incorrect, unjustified or are clear misunderstandings of the design, conduct and purpose of the original regulatory field studies, which could have been easily addressed by clarification with the authors,” the authors wrote.