New Study Shows Minimal Pesticide Impact on Bees

Angela Logomasini • July 18, 2017

A recently released study claims to have finally proven that certain pesticides are harming both honeybees and wild bees, and news headlines have sounded the alarm. For example, a *Los Angeles Times* headline exclaims: "Field Tests Show how Pesticides can Wreak Havoc on Honeybees," Yet a closer look at the data indicates that's not the case. The study data shows that the chemicals in question—called neonicotinoids or neonics—have very little measurable impact on bees, and any impact can be managed.

Neonics are systemic pesticides, which means they can be applied to seeds and are then absorbed into the plants. Accordingly, unlike sprayed pesticides that affect any insects on the plant at treatment time, only the crop-destroying insects that chew on the plants have significant exposures. Bees can have trace exposures because they bring pollen and nectar back to the hives. Accordingly, the study was designed to measure traces of the chemicals found in hives and any resulting impacts on bees.

Funded in part by two companies that make these chemicals—Syngenta and Bayer CropScience—this recent study attempted to assess the impact of the chemicals in real-life scenarios, rather than in a lab. Accordingly, it involved field tests, measuring exposures after bees foraged in oil seed rape (known as canola in the United States) crops in Hungary, Germany, and the United Kingdom. The researchers discussed their findings in an article for *Science* magazine, but the full dataset was made available to scientists at Syngenta and Bayer CropScience.

Syngenta's scientist explained at a recent event hosted by the Science Media Centre in the UK:

> This CEH paper does not present the full set of data analysis conducted by CEH and reported to Syngenta for honeybees. For example the pre-winter data analysis carried out by CEH which showed that any effects reported during the flowering period had disappeared (i.e. recovery), were not included in the paper. There were in fact 258 separate honeybee statistical data analyses reported to Syngenta by CEH. Out of these analyses, 238 resulted in no effect, 7 resulted in beneficial effects, 4 with insufficient data and only and 9 resulting in negative effects. The rules for statistical significance allow for a 5% probability of generating random effects. Therefore based on this internationally accepted statistical benchmark and the 258 analysis CEH carried out, we could expect 13 random results. Therefore the –ve and +ve results reported by CEH could easily be random i.e. not real, and a conclusion of no effect of the

> neonics reached. It should also be noted that the pollen and nectar residue analysis reported by CEH in this paper indicated that circa 95% of the time no neonic residues were measured, even in samples taken directly from the treated crop. Therefore bees in these trials were hardly ever exposed to any neonic residues.

That's quite an amazing finding that 95 percent of the time there were *no detectable levels* of neonics in hives or pollen from. This indicates a *very minimal exposures*, which should be considered a success. After all, the goal should be to find products that help farmers produce food while keeping risks low, and that does not mean risks will ever be zero. The simple reality is that any farming activity will have environmental impacts, so the key is managing them to maximize benefits and minimize unintended wildlife impacts. So if bees are only exposed 5 percent of the time when a chemical is used, that's a very good result.

Moreover, within the 5 percent of the time that there was exposure, the impacts were tiny and probably insignificant. The Hoover Institution's Dr. Henry I. Miller provides an excellent analysis of this data in Forbes. He points out that study showed that the overwhelming majority of the 258 analyses (97 percent) showed either no effect (94 percent) or *beneficial* effects (3 percent).

Only 3 percent of the analysis demonstrated adverse effects. Yet that small sample of adverse finings has become the focus among the researchers as well as all the news stories, which is absurd. "[T]he authors are basing their study's conclusions on a handful of outlier results–effects so small that they could be occurring by chance–amid a much larger amount of experimental data they generated that points to precisely the opposite conclusions," notes Miller.

The strongest conclusion that the researchers could draw as stated in the study abstract was that data "*points to*" the conclusion that the chemicals "reduced capacity of bee species to establish new populations in the year following exposure." Yet all the adverse impacts were found in Hungary and the UK; no problems were found in Germany where hives were apparently healthier with less disease-related problems.

One of the study's authors, Ben Woodcock, explained that the differences between countries suggests that healthier hives are less susceptible to the chemicals. He explained that rather than banning neonics, the solution lies in improving hive health through better beekeeping practices and improved diets though the planting of more diverse flowering food sources.

Woodcock points out that "Neonicotinoids do have a vital role to play in food production. As they can target particular insects they can be used in low dosages, reducing the need for broad spectrum insecticide sprays. They are also useful in controlling pests which have already developed some resistance to other pesticides."

Unfortunately, the headlines don't focus on those aspects and instead are being used to promote bans. Such hype in the past led European Union officials to temporarily impose bans on neonics in 2013 and this study may encourage them to make that ban permanent despite the adverse impacts for agriculture. For example, earlier this year, oilseed rape farmers in the UK petitioned the government to allow emergency use of neonics because of serious crop damage, but they were denied.

Ironically, the bees are also suffering ill effects of the misguided ban because farmers are forced to use more toxic pesticides. Matt Ridley explains: "In Britain, for example, the study finds that farmers have more than quadrupled the number of insecticide applications on oil-seed rape (from 0.7 to 3.4 per growing season), but pest pressure has increased." Apparently, the older treatments don't work as well either and hence, farmers are seeing greater crop damage.

Clearly, policymakers need to look at a broader perspective. If they care about both people and wildlife, they would look for balanced policy. Neonics have an important role and as the data in this most recent study shows, their impact on bees is negligible. And it's clearly better than many of the alternatives. So rather than expand regulation, they need to eliminate the counter-productive ban they issued in 2013.

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