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As Technical Advisor to the American Mosquito Control Association (AMCA), I read with interest the May 31, 2016 article titled "**Non-cultivated plants present a season-long route of pesticide exposure for honey bees**". In this article, the authors Long and Krupke concluded that "the highest levels of contamination in pollen are pyrethroid insecticides targeting mosquitoes and other nuisance pests," based on detections of phenothrin and prallethrin in pollen samples. The authors appear to consider adulticiding operations conducted by organized mosquito control entities as the likely culprit. However, there is no evidence that the researchers made any effort to either identify the source of the pesticide exposures or identify the target pest. This information is readily available and would have refuted the article's conclusions. Indeed, the state regulatory agency for pesticides, the local health jurisdiction, and any mosquito or vector control district would have been able to provide records of treatments it applied, as could many agricultural applicators.

Prallethrin and phenothrin are certainly active ingredients used in products registered for mosquito control. However, the article insinuates that the residues on the pollen samples were the result of applications *targeting* mosquitoes - that is false. There were no wide-area mosquito control applications taking place in Tippecanoe County during the summer of 2011.

The Indiana state pesticide registration database reveals that, in addition to Clarke's vector control products, there are 54 registered residential use products containing phenothrin that include outdoor labeled uses. Of these, 34 are Wasp & Hornet aerosols for direct application to nests, the remaining 20 with general residential pest claims and uses, including ornamental gardens and backyard bug control (i.e. Raid, Cutter, Black Flag). One is an automated backyard mister. There are no agricultural uses of phenothrin. Despite this, the authors appear determined to make a direct connection to 'mosquito' control - despite an overwhelming weight of evidence to the contrary.

The data displayed in Figure 1 in the article do not support concluding that the source of prallethrin or phenothrin is from mosquito control treatments. Interestingly, Figure 1 shows more prallethrin with virtually no phenothrin in samples collected earlier in the sampling period. The opposite seems to be indicated for samples collected later. If treatments of Duet® were contaminating pollen during the sample period, one would expect both prallethrin and phenothrin to show up together. If one of these degraded faster

than the other, one might expect to see residues of one decrease faster than the other. Figure 1 does not appear to indicate any such pattern.

Risk estimations used in the studies did not conform to standard accepted protocols. The authors combine frequency of detection, concentration, and the fact that foraging bees handle about 1 g of pollen per day to estimate risk. One assumption, which is almost certainly not true, is that handling 1 g of pollen equates to a bioavailable contact dose of the pesticide in that 1 g of pollen. Even if the bees collected pollen from many non-cultivated species, that doesn't necessarily mean that the non-cultivated species have pesticide residues on them. The authors determined residues from all of the pollen combined and did not differentiate among species.

The median residues for nearly all the pesticides identified are 0 ppb. Thus, the majority of samples contained 0 ppb of the pesticides in question. The authors further state that there is season-long exposure to pesticides in pollen. While technically true based on their reported findings, exposure is not the same thing as risk. Also, the opposite argument could just as easily be made; a majority of pollen samples had zero concentrations of each pesticide at any given time.

Professional mosquito control entities certainly share the authors' concern for pollinator safety and have been incorporating pollinator protection into their operations for several decades. It is clear that the findings unequivocally indicate that homeowner usage of the pesticides in question were responsible for their findings and fully absolves governmental mosquito control agencies. Most concerning, though, the conclusions stated therein could be used by activist groups to argue for the abolition of mosquito adulticiding altogether - a profound and potentially tragic mistake in light of the documented protection from mosquito-borne diseases that it provides.

Sincerely,



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