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The German Bee Monitoring (Deutsches Bienen Monitoring - DeBiMo) has existed for over 20 years and aims to understand drivers of colony losses, especially during winter. We have collected health measures, such as Varroa destructor infestation, pathogen presence, viral infections, and overwintering success since 2004. This citizen science project involves over 120 beekeepers nationwide with more than 1,200 colonies monitored annually. The overwintering dynamics of colony strength are monitored. Bee, honey and pollen samples for disease and residue analyses are taken up to three times per year in spring, summer and fall. Although pesticide residue analysis was first added in 2006, it has regularly been part of the annual analysis since 2009.

Here we report the preliminary pesticide residue results for N = 2,410 apiary samples. In the last few years, our multi-residue analysis has looked for residues in stored pollen of 475 different pesticides and their metabolites. Honey bees function like environmental monitors, foraging in a wide radius from their point-source colony. The residues detected thus essentially reflect current agricultural practices within a 2-6 km radius of the apiary, the typical foraging distance of honey bees.

We typically find only 15% of the suite of pesticide residues we investigate (n = 75 detected of 475 investigated), though this varies by sampling year. The residues are mostly in the trace range. We report five different ways of assessing pesticide risk: prevalence, diversity, concentration, relevant pesticides (contributing at least 50 points to the hazard quotient), and the actual hazard quotient. We compare the pesticide residues found in Germany with similar monitoring studies published in the United States. We also report on the overall trends of pesticide residues from 2009-2024, which mimic current agricultural plant protection policies.