

Research By: [University of Illinois](#)

For years, the **harmful effects of pesticide exposure on honey bees** have been well-documented. However, a recent study has shed light on the specific impact of pesticide sprays on the sense of smell in bees. This disruption in olfactory perception could potentially interfere with their ability to communicate through social cues.

Honey bees rely on a complex system of chemical signals to communicate within their dynamic communities. For instance, nurse bees use pheromones to monitor larvae and indicate their need for food. Additionally, alarm pheromones are produced by worker bees to warn others of danger. Proper perception of these cues is crucial for the colony's thriving.

The Role of Insecticides and Fungicides: Since 2007, honey bees have faced significant challenges, with insecticides being a major concern. Interestingly, fungicides, which were traditionally thought to be harmless to insects, have also been found to adversely affect bees. When combined, these chemicals can disrupt the overall function of the colony, posing further risks to bee health.

The Impact of Adjuvants: In almond orchards, where a large portion of U.S. honey bees are transported annually, pesticide spray mixtures have been implicated in bee health issues. Specifically, the problem lies in the use of adjuvants, supposedly inactive chemicals that enhance the stickiness of insecticides to plants. Despite being considered biologically benign, recent research has revealed that adjuvants, alone or in combination with other chemicals, can be toxic to bees, especially nurse bees.

Research Findings: To understand the effects of these chemical combinations on nurse bees, researchers conducted experiments using the adjuvant Dyne-Amic, the fungicide Tilt, and the insecticide Altacor. Bees were exposed to treated or untreated commercial pollen for a week, and their antennal responses to chemical mimics of brood and alarm pheromones were analyzed using electroantennography. The study found that consuming pollen contaminated with the three chemicals altered the bees' antennal responses, suggesting interference with honey bee communication.

Future Implications: The exact mechanisms through which these chemicals affect bees' sensory responses are still unclear. Further research is needed to explore the underlying molecular pathways and behavioral changes. Additionally, the study highlights the importance of investigating other commonly used pesticide mixtures and assessing the response of bees in different populations. Ultimately, these findings aim to assist beekeepers in reevaluating their colony management and protection strategies.

Source: sciencedaily.com