

State of the art and scientific production on the relationship between pesticides and bees

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Bees are the main pollinating insects in natural and artificial ecosystems. However, the excessive and indiscriminate use of pesticides has contributed to the decline of these insects. Studies are carried out worldwide to verify the impact of different pesticides on survival, physiology, and behavior of bees. The objective of this work was to ascertain the state of the art of research related to pesticides and bees. For this, a scientometric study was carried out, whose data were obtained from all the Web of Science (WoS) databases, using keywords and Boolean scripts for research: TOPIC: ("pesticide*" OR "herbicide*" OR "insecticide*" OR "fungicide*") AND TOPIC: ("toxicity" OR "mortality" OR "selectivity" OR "survival" OR "longevity") AND TOPIC: ("bee" OR "honeybee" OR "honey-bee"). After individual content review, 1,649 publications were selected, which were analyzed in WoS and CiteSpace. From the total number of publications, 1,202 belong to the last ten years. The H index of the publications is 107, thus demonstrating the relevance of this topic. The United States of America leads the top position on this subject, followed by France and England. Luc Belzunces (INRA – France) and Osmar Malaspina (UNESP – Brasil) are the authors with the highest number of articles on this subject. The main funding agencies are the United States Department of Agriculture (USDA), Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES), UK Research and Innovation (UCRI) and Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq). It is noteworthy that studies on the impact of neonicotinoid insecticides have continued to stand out in the last two years. Most of the articles are related to the genus *Apis*, although in the last two years, there has been a small increase with the other genera. The trend is for a significant rise in publications on this subject in the coming years.

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