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Improving Seed Treatment Methods: A Key Factor to Reduce the Risk to Honey Bees and other Pollinators to Maintain Biodiversity

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Abstract

Bees and other pollinators play a major role in maintaining the biodiversity in almost all environments. Pollinators support the reproduction of nearly 85 % of the world's flowering plants. However, these important species are endangered through the use of pesticides. In late April 2008, dust drift containing insecticide resulted in the largest bee poisoning in Germany for 30 years. The reason for these incidents was the contamination of flowering bee forage plants with dust particles abraded from maize seeds treated with the insecticide Clothianidin. Thus highly specialist techniques should be used when treating seeds with plant protection products to avoid such problem. The aim of this study was to improve the seed treatment methodology to reduce the drift generated from seeds by drilling and hence saving of bees and other pollinators as well as reducing the risk of people handling the treated seeds during the sowing activities and people located in the vicinity of the sowing site. The current study investigated the amount of drift generated from seeds of two varieties of cotton using two formulations of the neonicotinoid insecticide imadocloprid using the Heubach methods. The increase in percentages of drift generated with the use of Heubach Meter, through tested formulation of imadocloprid relative to the control treatment were found to be in the range of 336–378 % and 221–287% for the water dispersible powder formulation (WS) for Hamid and Barakat cotton varieties, respectively. For the Flowable Concentrate (FS) formulation the percentage increase in the drift over the control was ranging 82–95 % and 15–445 for Hamid and Barakat varieties respectively. The Heubach vaules were higher in case of WS formulations. They were ranging between 13.5–24.5 for Hamid variety and 23.3–25.4 for Barakat variety. The values for the FS formulation ranged between 7–8.8 and 2.64–14.7 for Hamid and Barakat, respectively. The pesticide residues measured were found to be more for WS formulation compared to FS formulation for both tested varieties. The results of the study indicated indicated that the Flowable concentrate formulation for seed treatment is better than the Water dispersible powder formulation and can play important role in improving seed dressing technology to save various pollinators

Keywords: Honey bees, insecticides, pollinators, biodiversity, seed treatment