

Persistence of Ready Mix (Chlorpyrifos 50% + Cypermethrin 5%), Cypermethrin and Chlorpyrifos in Soil under Okra Fruits

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Abstract : Background and Significance: Residue levels of ready mix (chlorpyrifos 50% and cypermethrin 5%), cypermethrin and chlorpyrifos individually in sandy loam soil under okra fruits (Variety, Varsha Uphar) were determined; a field experiment was conducted at Research Farm of Department of Entomology of Chaudhary Charan Singh Haryana Agriculture University, Hisar, Haryana, India. Persistence behavior of cypermethrin and chlorpyrifos was studied following application of a pre-mix formulation of insecticides viz. Action-505EC, chlorpyrifos (Radar 20 EC) and cypermethrin (Cyperkill 10 EC) at the recommended dose and double the recommended dose along with control at fruiting stage. Pesticide application also leads to decline in soil acarine fauna which is instrumental in the breakdown of the litter because of which minerals are released into the soil. So, by this study, one can evaluate the safety of pesticides for the soil health. Methodology: Action-505EC (chlorpyrifos 50% and cypermethrin 5%) at 275 g a. i. ha⁻¹ (single dose) and 550 g a. i. ha⁻¹ (double dose), chlorpyrifos (Radar 20 EC) at 200 g a. i. ha⁻¹ (single dose) and 400 g a. i. ha⁻¹ (double dose) and cypermethrin (Cyperkill 10 EC) at 50 g a. i. ha⁻¹ (single dose) and 100 g a. i. ha⁻¹ (double dose) were applied at the fruiting stage on okra crop. Samples of soils from okra field were collected periodically at 0 (1h after spray), 1, 3, 5, 7, 10, 15 days and at harvest after application as well of control soil sample. After air drying, adsorbing through Florisil and activated charcoal and eluting with hexane: acetone (9:1) then residues in soils were estimated by a gas chromatograph equipped with a capillary column and electron capture detector. Results: No persistence of cypermethrin in ready-mix in soil under okra fruits at single and double dose was observed. In case of chlorpyrifos in ready-mix, average initial deposits on 0 (1 h after treatment) day was 0.015 mg kg⁻¹ and 0.036 mg kg⁻¹ which persisted up to 5 days and up to 7 days for single and double dose, respectively. After that residues reached below a detectable level of 0.010 mg kg⁻¹. Experimental studies on cypermethrin individually revealed that average initial deposits on 0 (1 h after treatment) were 0.008 mg kg⁻¹ and 0.012 mg kg⁻¹ which persisted up to 3 days and 5 days for single and double dose, respectively after that residues reached to below detectable level. The initial deposits of chlorpyrifos individually in soil were found to be 0.055 mg kg⁻¹ and 0.113 mg kg⁻¹ which persisted up to 7 days and 10 days at a lower dose and higher dose, respectively after that residues reached to below determination level. Conclusion: In soil under okra crop, only individual cypermethrin in both the doses persisted whereas no persistence of cypermethrin in ready-mix was observed. Persistence of chlorpyrifos individually is more as compared to chlorpyrifos in ready-mix in both the doses. Overall, the persistence of chlorpyrifos in soil under okra crop is more than cypermethrin.

Keywords : chlorpyrifos, cypermethrin, okra, ready mix, soil

Conference Title : ICCABES 2018 : International Conference on Chemical, Agricultural, Biological and Ecological Sciences

Conference Location : London, United Kingdom

Conference Dates : December 13-14, 2018