

Pesticide-Related Risks Associated with the Crop Management Practices Performed by Small-Scale Tomato Growers in Mid Country, Sri Lanka

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Improper use of pesticides and pesticide residues pose a great threat to food safety and environmental health. Thus, the present study was conducted to assess the pesticide-related risks associated with tomato, a crop which is exposed to heavy usage of pesticides. The study was conducted using small-scale tomato farmers in Marassana, Sri Lanka. A detailed questionnaire based farmer survey was carried out using thirty farmers to evaluate the current pesticide handling practices adopted by them. Further, using three selected farmer fields in the study area, analysis of pesticide residue levels in tomato samples, collected at the time of harvesting according to our instructions, was done by Gas Chromatography-Mass Spectrometry and Gas Chromatography-Electron Capture Detection techniques. Findings of the present study revealed the presence of Chlorothalonil (0.066 mg kg^{-1}), Profenofos (0.024 mg kg^{-1}) and Phenthoate (0.096 mg kg^{-1}) in the collected tomato samples. According to CODEX guidelines Maximum Residue Limits (MRL) for Chlorothalonil, Profenofos and Phenthoate are 5 mg kg^{-1} , 10 mg kg^{-1} and 7 mg kg^{-1} respectively. Based on CODEX limits, in all the cases, detected pesticide residue levels were below the maximum residue limits (MRL). Moreover, the survey revealed that majority of the farmers in the study area do not practice the recommended pre-harvesting interval, do not dispose empty pesticide containers and do not follow protective measures during the application of pesticides according to safety recommendations. Even though, the detected pesticide residue levels in the selected farmer fields were below the MRL levels it indicates the potential risk of accumulation of pesticide residues in tomatoes and the results of the farmer survey indicate the potential risks associated with improper pesticide handling practices. Therefore, the present study emphasizes the importance of shifting to eco-friendly agricultural practices to ensure food safety and sustainability.

Keywords: Pesticides, Tomatoes, Chlorothalonil