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Risk mitigation methods for removal of pesticide residues in tomato for food safety

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The commercial production of highly cultivated and consumed tomato is dependent on regular usage of insecticides to protect the crop from insect pests. The increased consumer awareness and legal issues on food safety, with special reference to insecticide residues in foods, led us to attempt for cheap and effective methods for removal of pesticide residues to address the issues of consumer and food safety, as the farmers are not following the Good Agricultural Practices i.e., pre-harvest intervals. The most commonly used pesticides such as profenophos, chlorpyriphos, dimethoate, malathion, phosalone, quinalphos, triazophos and cyhalothrin were sprayed at recommended doses at fruit formation stage, samples were collected at 2 hours after treatment to quantify the deposits. The samples were subjected to various household treatments (tap water wash, lemon water wash, dipping in 2% salt water for 15 min, dipping in 2% tamarind water for 10 min, washing with 0.1% sodium bicarbonate solution, washing with 4% acetic acid solution, biowash, cooking), each in three replications, and analysed for residues so as to estimate the % removal and their effectiveness. Out of all treatments, washing with 2% salt solution for 10 minutes is very effective in removing 45%, 43%, 52%, 50%, 54%, 48% and 76% of Dimethoate, chlorpyriphos, quinalphos, profenophos, phosalone, cyhalothrin and malathion, respectively, and cooking removed insecticides in the range 55-80%. Dipping fruits and vegetables in 2% salt solution for 15 minutes is the best household method for removal of pesticide residues, and also the method is effective in reducing the residues below MRL (Maximum Residue Limits).

Keywords: Pesticide residues, tomato, food safety, risk mitigation, 2% salt solution.

Biography

Shashi Vemuri has 31 years of teaching, research and extension experience. Dr. Shashi worked with farmers on potato, ginger and turmeric crops, specialized in sugarcane bud chip method and management of borers. Presently working on pesticide residues in foods and food safety issues and Dr Shashi is heading the faculty of Entomology of the state guiding research in plant protection.

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