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Study of Fluopicolide migration in soil-water system and determination of harmful index

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Fluopicolide is a derivative of benzamides (IUPAC - 1-[(6-chloro-3-pyridinyl) methyl]-N-nitro-2-imidazolidinone), fungicide of system and contact action against late blight of potato and tomatoes. By soil persistence - it is the first class of hazard (highly dangerous compound). The active ingredient and the preparation in terms of the equivalent amount of the active substance in form of water solution were added into upper 20 cm layer of the lysimeters in three-fold replications in the concentrations: the first one complied with the maximal recommended consumption rate (1,6 l/ha) (1N) - 0.04 mg/kg and 0.7 mg/kg accordingly; the second one - 10 times below the maximal rate (0.1N) - 0.004 mg/kg and 0.07 mg/kg; the third one - 10 times above the maximal rate (10N) - 0.4 mg/kg and 7.0 mg/kg. Determination of fluopicolide concentrations in the water filters were carried out using the method of tandem mass spectrometry with high-efficiency liquid chromatography on reversed phase with triple quadrupole detector (0.0025 µg/dm³). The experiment carried out till reduction of the fluopicolide concentration in the samples of lysimetric water to its maximum permissible concentration in water of household and cultural-domestic water use (0,01 mg/dm³). After 1-11 days the fluopicolid was not detected in all its concentrations. The 12th day - active ingredient (0.1 N, 1N, 10N) - 0.003 mg/dm³, 0.006 mg/dm³, 0.14 mg/dm³, accordingly. With 13-20 days active ingredient and compound was detected in 0.1 N: 0.0021-0.0034 mg/dm³ and 0.0004-0.002 mg/dm³; 1N: 0.026-0,036 mg/dm³ and 0.0003-0.015 mg/dm³; 10N: 0.8-3.7 mg/dm³ and 0.03-0.07 mg/dm³, accordingly. The day 22d fluopicolide (1 N active ingredient and compound) made 0.01 mg/dm³. Based on the obtained results on harmful water migration index the safe threshold concentration of the fluopicolid was determined as 0.04 mg/kg, providing for the migration of ingredients from soil into groundwater safe for human health.

Biography

Valerii Rakitskii – Academician of the Russian Academy of Sciences, professor, Honoured Scientist of the Russian Federation, acting director of Federal Scientific Center of Hygiene named after F.F. Erisman, director of the Institute of Toxicology of Pesticides and Chemical Safety, F.F. Erisman Federal Scientific Center for Hygiene, Moscow. Main areas of research - development of the hygiene fundamentals, toxicology of pesticides and chemical safety, development of methodology and risk prediction of harmful chemicals, hygienic regulation of hazardous toxicants. The author of hygienic classification of pesticides according to the degree of danger and widely used Russian model of risk assessment for operators, generally recognized in the world along with the German and English models.

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