

**FORECASTING OF THE HAZARD FOR HUMAN HEALTH OF THE
CONSUMPTION OF VEGETABLES GROWN WITH THE APPLICATION
OF ABAMECTIN-BASED INSECTICIDE FORMULATIONS**

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One of the reasons for the annual pesticides assortment expansion, including for application on vegetable crops [1], is that most of vegetables are practically impossible to grow without protective measures. Applying the required amount of pesticides, the farmer can potentially save from 1 ha of land up to 95 hundredweights of sugar beet, 40 hundredweight of potato etc. [2, 3]. However, the presence of pesticides residues in foodstuffs can lead to health disorders [4, 5]. That is why

assessing the risk associated with the consumption of pesticide-containing products is a vital and integral part of regulatory processes.

The purpose – forecasting of the hazard for human health of the consumption of vegetables grown with the application of abamectin-based insecticide formulations.

Research materials and methods. The insecticide abamectin belonging to the class of aversectins has been studied.

The parameters of its stability in grapes, peaches and cherries in soil and climatic conditions of Ukraine are given by the results of own field studies. Vegetables samples were sampled for the study, starting from the day of last treatment and at certain dates, 3-6 times during the growing season until the harvest time. For comparison, prior to the treatment, the control vegetable samples were taken. In the control samples, the active substances were not detected.

A half-life (τ_{50}) of the substance in plants was calculated used the method of mathematical modeling.

For the classification of substances by stability in plants the Ukrainian classification of pesticides by the degree of hazard State Standard 8.8.1.002-98 [6] has been used. This classification provides for the separation of substances by stability in plants into 4 classes: 1 – highly persistent (τ_{50} more than 30 days), 2 – persistent (15-30 days), 3 – moderately persistent (5-14 days), 4 – slightly persistent (less than 5 days).

Hygiene and Ecology Institute specialists have recommended for the integral assessment of the potential hazard of pesticide effects on the human body when consuming contaminated agricultural products, a four-grading scale, which in points evaluated the allowable daily dose (ADD), half-life period (τ_{50}) in plants and average daily product consumption [7].

After adding all the points, the integral index of pesticide-contaminated products the consumption was evaluated as follows: when its value is 3-5 points - substance is hazardous for humans (class 4), 6-8 – moderately hazardous (class 3), 9-11 – hazardous (class 2), 11-12 – extremely hazardous (class 1) [7].

Results and discussion. Mathematical processing of the results obtained during the field experiment of abamectin residual amounts dynamics in vegetables studying showed that in the soil-climatic conditions of Ukraine the process of their decomposition in crops was subject to exponential dependence.

According to stability in cucumbers, eggplants abamectin was classified as hazard class 4 (slightly persistent), in tomatoes – hazard class 3 (moderately persistent).

For integral assessment of the potential hazard of exposure of the test compound to the human body when consuming contaminated agricultural products, on a four-grading scale we estimated allowable daily dose (0.0002 mg/kg – 4 point), daily average consumption of cucumbers, eggplants, tomatoes ($69 + 39 + 69 = 170$ g/day – 2 points) and maximum half-life period (τ_{50}) in these vegetables (5.4 ± 0.2 days – 2 point). Thus, by the magnitude of the integral hazard index when consuming pesticide-contaminated products (8), abamectin belongs to the hazard class 3 – moderately hazardous.

Conclusion. It was found that abamectin is moderately persistent in cucumbers, eggplants, tomatoes. By the integral hazard index when consuming pesticide-contaminated products value abamectin belongs to the 3rd hazard class (moderately hazardous).

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