SUBSTANTIATION OF NECESSITY FOR MONITORING IN THE ENVIRONMENTAL OBJECTS OF AVERMECTIN INSECTICIDES CONSIDERING THEIR POSSIBLE IMPACT ON THE THYROID GLAND

UZASADNIENIE KONIECZNOŚCI MONITOROWANIA W ŚRODOWISKOWYCH PRZEDMIOTACH AVERMECTINOVYCH INSEKTYCYDÓW Z UWZGLĘDNIENIEM ICH MOŻLIWEGO WPŁYWU NA DŁONIĘ TARCZYCY

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On the one hand, pesticides are an economical, labor-saving and effective mean for the control of pests, diseases and weeds in agriculture. On the other hand, they are a significant risk factor for professional and non-professional contingents. Especially given their potential impact on the endocrine organs.

The purpose of the work was substantiation of monitoring in the environmental objects necessity of avermectin insecticides considering their possible impact on the thyroid gland.

Materials and methods. Methods of laboratory and field hygiene experiments, physico-chemical (chromatographic), physical methods, methods of mathematical modeling (calculation) and statistical analysis. Statistical processing of the results performed with statistical software IBM SPSS StatisticsBase v.22.

Results and discussion. When deciding on the necessity of monitoring a pesticide that affects the thyroid gland, evaluate each of the proposed indicators in points. Namely: allowable daily dose; hazard class according to StateStandard 8.8.1.002-98; effect on the thyroid gland as a target organ; the level of tyrosine in the blood plasma, nmol/ml; half-life (τ_{50}) in soil, water, crops, day; leaching index in soil and surface water (LEACH, c.u.); the

maximum possible concentration of pesticide in water (SCI-GROW, μg/l); integral index of contaminated with pesticide water (IIPCWC) and food consumption (IIPCFC), points. Find their total. If the formulation based on the test compound are used on different crops or in different soil and climatic conditions, then the highest value of the half-life is taken for evaluation.

After adding all points received, the necessity for monitoring is evaluated as follows: for a total of 11-16 points – monitoring is not required; 17-27 points – monitoring is desirable; 28-38 – mandatory monitoring; 39-44 – pesticide application should be prohibited.

We have studied two avermectins in our study: abamectin and emamectin benzoate. Each criterion was evaluated according to the proposed scale in points and their sum was calculated: 25 and 24 points for abamectin respectively in the soil and climatic conditions of Ukraine and other European countries; 22 and 20 points for emamectin benzoate, respectively.

Conclusion. Based on the results obtained, both test compounds are assigned to the second pesticide group, hygienic monitoring of which is desirable but not obligatory. This is due to their low stability in environmental objects.

Key words. Monitoring, environmental objects, insecticides, thyroid gland.

Słowa kluczowe. Monitoring, obiekty środowiskowe, insektycydy, tarczyca