HAZARD FORECASTING FOR HUMAN WHILE CONSUMING AGRICULTURAL PRODUCTS CONTAMINATED BY PYRAZOLECARBOXAMIDE CLASS FUNGICIDE PYDIFLUMETOFEN

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An integral part of intensive technologies for growing crops is chemical plant protection products application to combat various diseases. But the presence of residual amounts in food products and raw materials may lead to violations in the health of consumers [1, 2]. Namely, the relationship between the level of morbidity of the population and the chemical, microbial and radioactive pollution of the environment, as well as the level of medical care is established. Thus, it was proved that with an increase in chemical pollution by 2 times the general level of morbidity of the adult population increases by 25 % [3]. Therefore, the assessment of the risk associated with the consumption of products containing pesticide residues is a vital and integral part of regulatory processes.

The purpose of our work was to forecast and compare the danger to a person when consuming agricultural products contaminated with new pyrazolecarboxamides class fungicide pydiflumetofen.

Materials and methods. For an integrated assessment of the potential hazard on a four-graded scale, the allowable daily intake (ADI), the half-life in plants (DT_{50}), and the average daily consumption of the product were estimated [4]:

if ADI >0,02 mg/kg – 1 point, 0,0051–0,02 mg/kg – 2 points, 0,0021–0,005 mg/kg – 3 points, ≤0,002 mg/kg – 4 points;

if DT_{50} <5 days – 1 point, 5-14 days – 2 points, 15-30 days – 3 points, >30 days – 4 points;

if average consumption of food <100 g/day – 1 point, 100-200 g/day – 2 points, 201-300 g/day – 3 points, >300 g/day – 4 points/

After adding all the obtained points, the integral index of pesticide contaminated product consumption hazard (IIPCPCH) was estimated as follows: with the value of IIPCPCH of 3-5 points - substances were low dangerous to humans (class 4), 6-8 – moderately dangerous (class 3), 9-11 – dangerous (class 2), > 11 – extremely dangerous (class 1).

Information on physico-chemical properties, as well as the main toxicological characteristics are given according to the literature [5].

Results. According to persistence in crops, fungicides of the pyrazolecarboxamide class, including pydiflumetofen, can be classified as hazard classes 4 (low hazardous compounds).

The pydiflumetofen ADI = 0,092 mg/kg – 1 point; DT_{50} <5 days – 1 point; average consumption of vegetables and cereals =100-300 g/day – 3-4 points.

By the value of IIPCPCH investigated compound belong to the 3rd class of hazard – moderately hazardous (6 points). This is due, first of all, to the fact that they are low toxic and rapidly destroyed in agricultural products. In addition, the formulations based on the studied compounds are used mainly for the treatment of grain crops that are not used by human in raw form.

Conclusion. It was established that by the value of the integral index of pesticide contaminated product consumption hazard (6 points) new pyrazolecarboxamides class fungicide pydiflumetofen belongs to 3 classes of hazard – moderately hazardous.

Reference

1. Черных А.М. Угроза здоров’ю человека при использовании пестицидов. *Гигиена и санитария*. 2003. № 5. С. 25–29.

2. Safe use of pesticides. WHO Technical report cseries. Geneva, WHO. 1991. Vol. 813. 179 p.

3. Лико Д.В., Гущук І.В. Оцінка ризику для здоров'я сільського населення від впливу факторів середовища життєдіяльності людини. Монографія Рівне: РДГУ, 2010. 229 с.

4. Antonenko A.M., Vavrinevych O.P., Omelchuk S.T., Korshun M.M. Hygienic substantiation of forecasting model of hazard for human when consuming agricultural products contaminated with pesticides **(**on pyrazolecarboxamide class fungicides example). *The unity of science*. 2018. August. P. 46–48.

5. PPDB: Pesticide Properties Data Base. http://sitem.herts.ac.uk/aeru/footprint/en/. (23.11.2017)/