Some of them contribute to harmful effects on the foetal development (R63 — fenpropimorf, metconazole) and to fertility impairment (R62 — fenpropimorf, vinclozoline). The greatest hazard to the environment is posed by insecticides because of the lack of active substances, which are selective for the fauna biocenoses. The domination of pyrethroids (alpha-cypermethrin, beta-cyfluthrin, cypermethrin, deltamethrin, lambda-cyhalothrin) — compounds that are highly toxic to insects and fish — should be considered the most adverse factor in the area under study. Their another adverse property is that they easily diffuse in the air; however, they are not easily rinsed from the soil (Tab. 4).

The high participation of harmful phosphoorganic compounds (chloropiryphos methyl, dimetoat, fenitrothion) should also be noted. The use of low-hazard insecticides — chitin biosynthesis inhibitors — was recorded only in single cases (not included in Tab. 4). A characteristic phenomenon in the district of Nidzica, despite its highest consumption of pesticides, was a relatively high percentage of chemically unprotected areas. It was established, for instance, that of the 87 farmers who cultivated rye in the district of Nidzica, 34 persons declared that they used no chemicals whatsoever to protect this grain. Such cases were not recorded in the districts of Giżycko and Mrągowo and were scarce in Ostróda.

DISCUSSION

It is a relatively difficult task to accurately assess the level of plant protection solely on the basis of the consumption of plant protection products as its parameters in this respect are of a temporary nature. They depend on the plant protection needs of the leading species of plants and on the range of compounds used. The study showed that the average consumption of plant protection products in the area under analysis was similar to that found in the district of Bartoszyce, i.e. in the north of the Warmia and Mazury province [12], but it was smaller than that found in similar studies carried out in this province in 2002 [13,14]. The mean use of pesticides in the farms under study was 1.2 kg×ha⁻¹, which was more than the average value of 0.78 kg×ha⁻¹ for the whole country in 2001 [5]. These values are much lower than those recorded in many other EU countries.

The greatest share (approx. 50% of pesticides consumption in a given area) belonged to herbicides, which is consistent with the current trends in plant protection [15]. However, this does not mean that the hazard associated with these treatments is lower in Poland than in other countries where more pesticides are used. It has been proven, for example, that methyl metsulphuron — a sulphonylurea derivative — when used in doses 100 times lower than recommended caused damage to plants [16].

The greatest hazard is related to the use of agents of high acute toxicity, a wide range of action, long persistence in soil and ability to bioaccumulate [17].

According to the Environmental Protection Agency (EPA), exposure to 2,4-D by drift or washing out is potentially hazardous to land vegetation, mammals, and birds. This active substance is a strong eye irritant, endocrine disruptor and may cause other chronic disorders. For these reasons, such herbicides have been banned from use in Denmark, Norway and Sweden [18]; this is also the case with atrazine that used to be a frequent source of groundwater contamination in EU countries [19]. Residues of atrazine, 2,4-D, MCPA, dicamba were also detected in groundwater in Poland, [20]. Among the fungicides applied in the area under study, many potential environmental hazards are related to the presence of carbendazim and vinclozoline [21].

In practical terms, it is very important to determine the degree of soil contamination in relation to the distance from the site, where the pesticide is applied [22], since even substances commonly considered safe, e.g., insect growth regulators used as insecticides, may cause serious disorders in biocenoses [23].

T. Banaszkiewicz, D. Murawa, J. Sulima

EKOTOKSYKOLOGICZNA CHARAKTERYSTYKA PESTYCYDÓW STOSOWANYCH W ROKU 2003 W PÓŁNOCNO-WSCHODNIEJ CZĘŚCI WOJEWÓDZTWA WARMIŃSKO-MAZURSKIEGO

Streszczenie

Badania ankietowe prowadzono w grupie 375 wielkoobszarowych gospodarstw rolnych znajdujących się na terenie powiatów Ostródzka, Nidzica, Mrągowo i Giżycko. Przeciętna powierzchnia gospodarstw wynosiła 75,5 ha, zaś zużycie pestycydów 1,2 kg×ha⁻¹. W strukturze upraw dominowały zbóż oziome i jare, rzepak oziemny, kukurydza i w niewielkim zakresie.
ziemniaki. Największe zagrożenie dla fauny biocenoż wśród stosowanych pestycydów stanowiły pyretoidy, które domino-wały wśród insektycydów. Większość herbicydów i fungicy-dów należała natomiast do substancji o różnym stopniu szkodliwoścی dla organizmów wodnych.

REFERENCES