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ANALYSIS OF THE CONSEQUENCES OF THE NEGATIVE IMPACT OF PESTICIDES IN BIOCENOSES**Trokhymenko G.G.,***Dr. Tech. Sciences, professor**Head of the Department of Ecology and Environmental Protection Technologies**antr@ukr.net***Grushyna O.G.,***senior lecturer of the Department of Ecology and Environmental Protection Technologies**olga.bidnichenko@nuos.edu.ua**Admiral Makarov National University of Shipbuilding**Mykolaiv, Ukraine*

This work is devoted to the urgent issue of today - the analysis of the negative impact of pesticides on the natural environment, which has not been sufficiently studied due to the complexity of the interaction of pesticides with the elements of the main components of biocenoses. It is shown that the reasons for the contamination of biocenoses with pesticides are violations of their application regulations, the use of persistent preparations and other technological factors.

Key words: ecosystem, pesticides, biocenoses, pollution, negative impact, resistance.

A significant part of the pollution of the natural environment is made up of chemical substances that mankind introduces into ecosystems to protect against pests, diseases, and weeds. The impact of some pesticides on the natural environment has not been sufficiently studied due to the complexity of their interaction with the elements of the main components of biocenoses. On the one hand, the use of plant protection products against harmful organisms is an integral part of modern technologies for growing agricultural crops.

On the other hand, the often unjustified and unlimited use of pesticides leads to the accumulation of pesticides and their metabolic products in the soil, water, and air.

The purpose of the work is to study the negative impact of pesticides on the biocenosis and its components.

Human activity primarily affects the state of the lithosphere, and the main load is felt by its surface layer - the soil cover, one of the main natural components that determines many processes that take place in the biosphere, and maintains the environmental condition necessary to preserve human health. An integral indicator of the state of the soil is its biological activity - a complex concept that reflects the set of processes that occur in the soil.

In today's conditions, during agricultural use, the soil is regularly contaminated with pesticides belonging to various classes of organic and inorganic compounds: organochlorine compounds, triazine derivatives, halogenobenzoic acid derivatives, acid amides and nitriles, nitrophenols, arylcarbamic and alkylcarbamic acid derivatives, urea derivatives, organic phosphorus compounds etc. On average, up to 300 kg of chemicals are used per hectare of arable land in the world. With their accumulation in plants (and some pesticides remain stable in the soil for a long time), it is possible for them to enter food chains.

Features of the distribution of soil microorganisms are related to the geography of the main types of soils. According to the research results, it is indicated that the impact of the soil cover reaction to different groups of pesticides is not the same. Since most microorganisms in the soil are aerobic, therefore, increasing the aeration of the soil layer provides a positive effect on the decomposition of pesticides.

Studies of the interaction of pesticides with biota have shown that the results of negative impact can be classified in the following directions: 1. formation of resistance in harmful organisms; 2. negative impact on plants and animals; 3. accumulation and transmission by power supply chains.

Circulation of pesticides in the environment can take place according to the following schemes: 1. air – plant – soil – plant – herbivore – human; 2. soil – water – zoophytoplankton – fish – man.

The arrival of pesticides occurs according to their inherent physical and chemical properties, such as solubility in water and fats and sorption on solid bodies. Sorption of most pesticides varies depending on the mineral part of the soil and is mainly related to the content of organic matter in the soil. Organic matter contains ingredients that have a significant sorption capacity for ionized and non-ionized pesticides, soluble in fats and water.

The main reasons for the contamination of biocenoses with pesticides are violations of their application regulations, the use of persistent preparations and other technological factors [1]. Acute and frequent situations of contamination of biocenoses occur due to increased consumption rates of pesticides (overdose), which are caused by errors in the calculation of the consumption rate of the pesticide or working mixture.

It should be noted that the quality of many used phytopharmacological agents (especially fungicides and herbicides), as well as the majority of small-packaged pesticides, does not meet state standards due to violation of storage conditions and non-compliance with temperature regimes. The container for storing means does not always meet safety requirements, as well as its tightness, which leads to deterioration of the properties of the pesticides themselves.

Visible manifestations of pollution can be preceded by hidden ones, as a result of which the ecosystem is destroyed or its productivity decreases. In addition to the process of bioaccumulation of pesticides, the process of their biotransformation is possible. Decomposition of pesticides can be accompanied by both pesticide detoxification – the loss of the original substance of toxic properties, and toxification – the formation of more poisonous substances, and unpredictably, and involving two or more pesticides. The nature of the action of pesticides in the natural environment is influenced by temperature, humidity, lighting and other abiotic factors, as well as the physiological state of organisms that have been exposed to pesticides or their decomposition products.

Pesticides enter the soil in all cases of their use. In the future, a certain part of them decomposes into non-toxic products within several months, the other part is stored for a long time (even years) and is involved in the system of circulation of substances in nature.

The self-cleaning of the soil, compared to the self-cleaning of the atmosphere and hydrosphere, occurs very slowly, therefore, as a result of long-term use of pesticides, their effect became manifested on a global scale. Of the huge number of insects, only 0.3% or 5,000 species are harmful, and 250 species have been found to be resistant to pesticides. From a general biological point of view, resistance can be considered as a change in populations as a result of the transition from a sensitive strain to a resistant strain of the same species as a result of selection caused by pesticides [2]. To combat resistant populations of harmful organisms and to prevent the emergence of resistance to pesticides, it is necessary to carefully observe the norms of consumption of drugs and the terms of their use.

The main source of pesticides entering the air is their evaporation from agricultural and forestry processing facilities. It should be emphasized that the evaporation of pesticides from the soil surface is more intensive than when the drugs are used in the soil, where they are retained by soil colloids. Pesticides are removed from the air through precipitation and photochemical degradation.

Pesticides can enter water bodies directly from the soil or from the atmosphere. In most cases, the presence of pesticides in water causes a violation of many physiological and hematological indicators in fish. In the aquatic environment, most pesticides are destroyed, but more resistant ones can migrate and accumulate in hydrobiota and mud, which determines their danger

Conclusions. The negative impact of pesticides manifests itself on almost all components of the biocenosis: soil, soil microorganisms, water bodies, atmosphere, insects, fish, herbivores, humans. The main reasons for the contamination of biocenoses with pesticides are violations of their application regulations, the use of persistent preparations and other technological factors.

LITERATURE

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