Toxic chemicals and their impact on the environment

Tuynazarova Irda Abdubokievna
Jizzakh Polytechnic Institute, Jizzakh region, Jizzah city, Uzbekistan

Annotation. Inefficiently considered chemicalization of industry, agriculture and household causes a great danger to the environment and human health. Violation of norms and rules of application of pesticides and fertilizers lead to the fact that the content of toxic substances increases and in some regions exceeds permissible values. The consumption of chemically contaminated food has a negative impact on the health of people, especially children. Biological activity of pesticides causes the deaths of not only harmful but also beneficial organisms. Therefore, much attention is currently paid to the creation of selective treatment aimed only against harmful organisms. These works are based on biochemical different organisms.

Keywords: pesticide, the negative effect of pesticide, fertilizer, harmful substances, human health.

Over the decades, the amount of waste has been increasing in proportion to the growth of production and population. So far, substances of plant and animal origin (wood, flax, cotton, leather, fat, etc.) were widely used as raw material and production waste was processed by natural forces in the natural cycle of substances, nature has so called self-cleaned. For instance, once discharged into the river, soap contaminated waste water quickly cleared by the decomposing microorganisms. When wood is burned, carbon dioxide (CO2) it emits is absorbed by plants during photosynthesis process.

If the waste is not absorbed naturally, it will result in residues and waste consisting of synthetic and mineral substances. For example, the waste synthetic detergents (washing powders) are not absorbed by decomposing microorganisms, they are accumulated in the ponds and pollute them. When petroleum fuel (masut) and coal are burned, it emits together with flue gases, except for carbon oxides (CO2, CO), sulfur oxides(SO2) into the atmosphere, which in interaction with the moisture and oxygen form sulfuric acid — so-called "acid rain"[2].

The danger of environmental pollution is aggravated when waste production and vehicle emissions, as well as items which are worn out or outdated, contain substances or chemical elements with toxic properties.

For instance, each fluorescent lamp contains about 150 mg of mercury. Worn out bulb that is thrown in dump, breaks and pollutes by contaminating the air, soil, and reaches groundwater reservoirs. Only one broken fluorescent lamp mercury pollutes at the level of maximum permissible concentration (MPC) of 500 thousand cubic meters of air. In order to increase octane number, to the gasoline usually tetraethyl lead (C8H18), Pb. is added. The lead which is contained in gasoline, after the combustion of the fuel is emitted with the exhaust gases, polluting the air, settling on vegetation and soil along the highways. 1.0 g of lead is emitted to the atmosphere during the combustion of 1 kg of leaded gasoline [3].

Thus, inefficiently considered chemicalization of industry, agriculture and household causes a great danger to the environment and human health. One of the most common and highly dangerous pollutant is oil and petroleum products. With the increase of oil production, its spillage increases during its transportation, processing and use. When released into water, oil and petroleum products form a floating film on the surface of water, partially soluble, however partially creating a stable emulsion and dumped on the bottom of water. Concentration of oil in water kills the eggs and young fish, as well plankton (protozoa that lives in the water and are food for fish).

Another common source of environmental pollution are pesticides and fertilizers used for agricultural purposes. Over the past 45 years the use of mineral fertilizers has increased by 43 times, and the variety of pesticides in 10 times. As a result of intensive chemicalization, it was managed to increase the yield of crops by approximately 2 times, while potatoes by only 15%. Violation of the rules and regulations of application of pesticides and fertilizers leads to the fact that the content of toxic substances is increasing and in some regions exceeds the permissible value. Consumption of chemically contaminated food adversely affects health of people, especially children. Fertilization of soil with mineral fertilizers in quantities exceeding the standards set by science, leads to a reduction of the storage duration of crops — vegetables rot much faster.

In the 80-ies it was found that the ozone layer in the atmosphere was reducing, and so-called ozone holes were discovered over the Earth — a region with low concentration of ozone. The ozone layer is located at high altitudes (20-30 km and above) and holds hard ultraviolet radiation of the sun. This type of radiation is harmful to humans, flora and fauna. It has been suggested that the reason for the appearance of "ozone holes" is the destruction of ozone (O3) under the action of CFCs (chlorofluorocarbons) used in refrigerators and aerosol spray cans. Along with the CFCs, nitrogen oxides also have a damaging effect on the ozone, which is produced from combustion of substances used on high-altitude aircraft and nuclear explosions.

It is also important here to mention a few more examples which has a high contamination level on the natural environment which occurs as a result of economic activities. For example, metallurgic production waste, power plants, chemical plants along with all types of transport, and waste of individual plants that contains heavy metal salts and other compounds pose serious danger to the environment.

Management of the proper use of pesticides and chemicals in agricultural activities.
As part of agricultural activities, in order to combat diseases and pests of plants, range of agricultural practices are implemented, such as creation of resistant pests and disease varieties, usage of biological, chemical and other methods directly or indirectly affecting pests of cultivated plants, etc. Currently, agricultural production is more effective in combating diseases and pests of plants by using chemical method which provides protection for harvest and high economic efficiency.

The discovery of the chemical means of plant protection from different pests and diseases is one of the most important achievements of scientific-technical advances. The usage of such chemical means has become an integral part of the development of modern agricultural techniques.

Each year the range of pesticides for agricultural purposes is increasing. In all countries of the world, currently more than 10,000 different mixtures are applied for production, which contain more than 600 chemical compounds belonging to different classes. In the United States of America (USA), for example, in the range of pesticides 1000 names in France 400-450, in Germany – 300, Japan, 140-160, in the USSR in 1980 104 treatments were produced. {4}.

Economic efficiency of application of pesticides is confirmed by robust data. According to Norman (1974), in 1850, one person who is working in a cultural activity in the USA, could provide the agricultural products for four people, in 1900 this number increased to seven people, in 1940 to 11 and in 1974 to 55 accordingly. Researchers mostly associate this productivity growth with increasing implementation of intensive usage of pesticides. They calculated that if the USA did not implement chemical means of protection of harvest on a large scale, production of potato, apple and cotton would have been reduced by 50%, and meat, milk and wool by 25%.

Experts estimate that timely and effective protective measures allow to save 2-3 kg of grain on average per hectare, 5 kg of rice, not less than 15 kg of potatoes, vegetables, sugar beet, fruits and grapes.

**Brief details about pesticides.** Pesticides is a common collective name for chemicals used for agricultural purposes to protect plants and animals originating from the word “pestis” – plague, destruction, “cیدو” – to kill. This is a variety a chemical compound that has the ability to destroy or stop the development of living organisms – insects, mites, mammals (rodents), bacteria, viruses, spores, fungi, harmful vegetation, etc.

Due to the biological activity, pesticides cause the death of not only harmful but also beneficial organisms. Therefore, at present great attention is paid to creation of preparations of selective action, directed only against harmful organisms. The usage of such mixtures is based on different biochemical organisms.

Methods of application of pesticides. Pesticides are used in various reductive forms, most often in the form of dusts, granular preparations, suspensions, emulsions, aerosols and fumigants. Dust is a powdery mixture consisting of a basic poison (active substance) and a filler. Tale, chalk, gypsum, kaolin, etc. are used as fillers. Dusts are produced in a centralized manner at the plants. It is not allowed to prepare local dusts (on collective farms and other farms) {3}.

Granular compounds are prepared by impregnating granules or various minerals (bentonite, kaolin, vermiculite), or mineral fertilizers. The size of the granules depends on the purpose of the drug (from 0.25 to 5 mm in diameter).

Methods of using pesticides depend on their formulation and purpose (seed treatment, spraying, pollination, treatment with granular preparations). Application strategies of pesticides is based on biological features of vermin, pathogens, and weeds. When using pesticides, the correct choice of the rate of consumption of the treatment is of great importance. It is determined by the active substance contained in a particular preparation, at the rate of per unit area (per 1 ha, per tree). The following formula is used to calculate the rate of application: \( H = \frac{100}{D/C} \), where \( H \) is the application rate of the drug; \( D \) is the dose of active substance; \( C \) – content of active ingredient in the treatment (in %). The obtained value shall not exceed the norm provided for by the “List of chemical and biological means of pest control, plant diseases and weeds permitted for use in agricultural activities”. Pesticides should have standard composition, stability in storage {3}.

It is however, not yet possible to abandon the usage of pesticides which is the most effective means of combating pests and plant diseases. Nevertheless, it is necessary to ensure strict control over their use of it, in order to avoid possible harmful effects of pesticides on human health. It is necessary to regulate the established requirements of safety, storage, transportation and use of pesticides.

**Conclusion**

One of the negative consequences of the use of chemicals is the emergence of a pesticide-resistant population on a rapidly cultivated crop. However, these measures do not fully address environmental and conservation concerns. This can only be solved by non-chemical treatments.

The use of biological methods can solve two problems at once: to protect the crop from pests and most importantly, to protect the environment from hazardous chemicals. Methods of biological pest control is being developed in all countries of the world.

To prevent or reduce pollution in Uzbekistan, various measures are carried out including but not limited to technological, sanitary, technical, legal, medical, etc. Control of the content of harmful substances is regulated by sanitary and hygienic norms (PDK) and is considered to be the basis of all the carried out measures. Regulation is necessary to order to obtain information on the level of pollution, as well as on the sources of emissions, causes and factors that determine pollution. The data obtained allows to choose or carry out protective, recreational activities and monitor their implementation.

**Bibliography:**