

The situation in Armenia related to the use of chlorpyrifos and its impact

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“RURAL SUSTAINABLE DEVELOPMENT” AGRICULTURAL FOUNDATION

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The situation in Armenia related to the use of chlorpyrifos and its impact

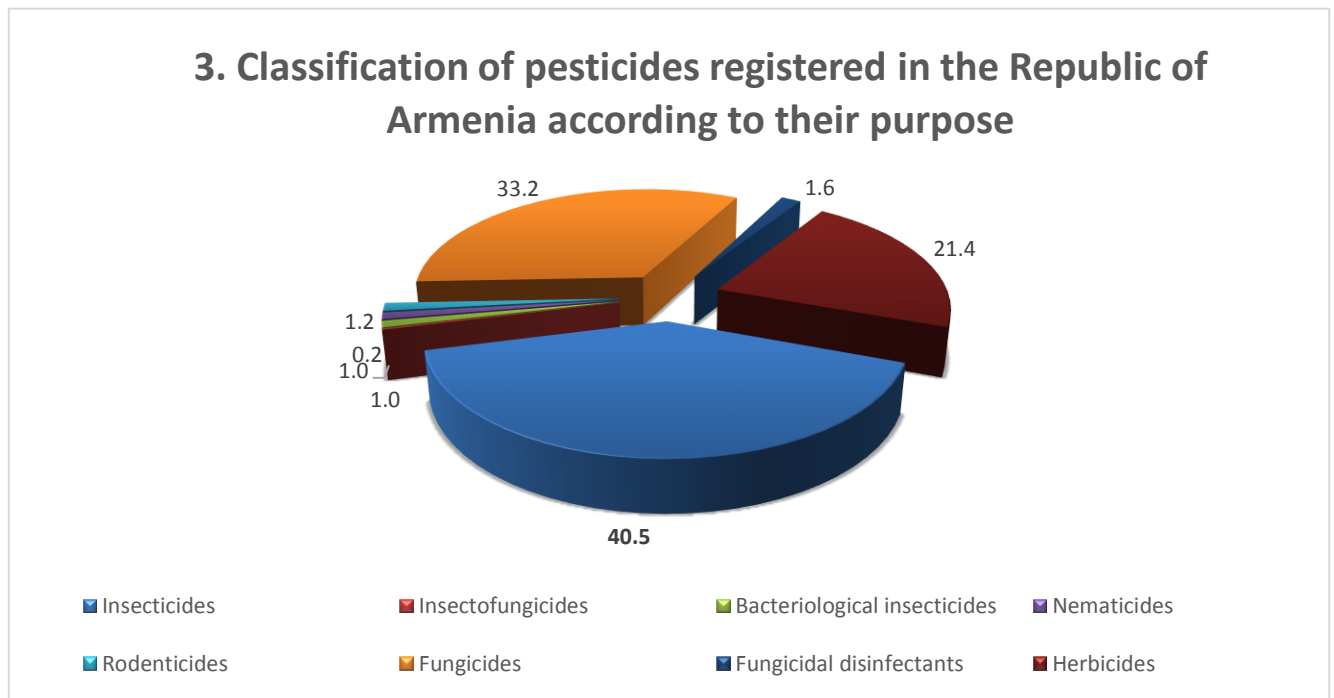
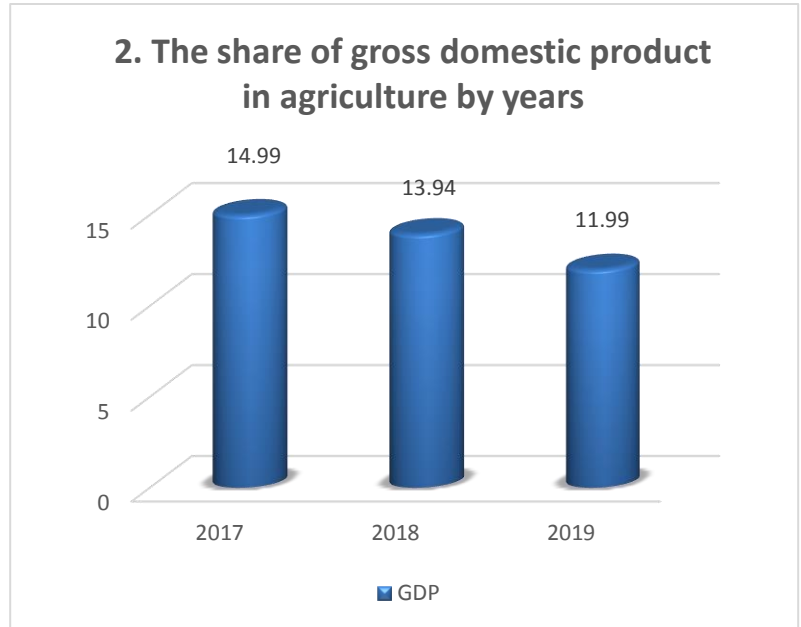
Agriculture is one of the most important sectors of the Armenian economy, providing employment for the majority of the rural population.

Based on the data of the Report of the Statistical Committee of the Republic of Armenia, it should be noted that in 2019, compared to 2017, there was a tendency of decreasing formal and informal employment in agriculture of Armenia.

The share of agriculture in gross domestic product (GDP) also decreased in 2019 compared to 2017.¹

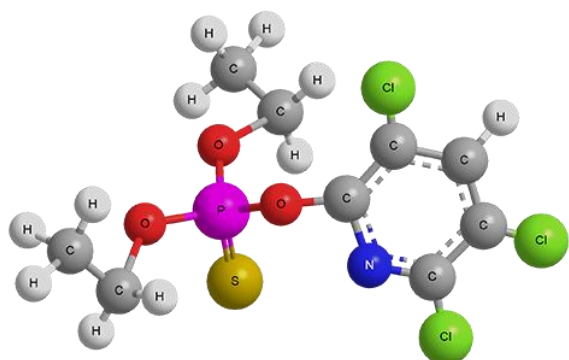
The number of pesticides used to grow agricultural crops is growing. As of 2020, the list of pesticides registered in Armenia includes 947 pesticides.

The classification of pesticides registered in the Republic of Armenia according to their purpose is presented in Figure 3.



¹ <https://www.statista.com/statistics/440577/armenia-gdp-distribution-across-economic-sectors/>

According to the list of imported pesticides registered in Armenia in 2020, 40.5% of the imported pesticides were insecticides, 33.2% were fungicides, and 21.4% were herbicides.



Chlorpyrifos-containing insecticides account for 11.2% of insecticides. Chlorpyrifos is one of the most common herbicides.

It is an organophosphate insecticide of the 2nd class of toxicity, used not only in agriculture, but also for medical and household disinfection to kill harmful insects.

According to the list of pesticides and agrochemicals permitted for use in the Republic of Armenia in 2015, 15 pesticides were allowed to be used, the active ingredient of which was chlorpyrifos or chlorpyrifos was combined with another active ingredient.

That year, the following chlorpyrifos-containing pesticides were permitted to be imported to Armenia: Agrifos, Agrifos 5 H, Banzai 4, Husban, Napoleon, Robust, Sarban, Chlorpyrifos Aria, Chlorpyrifos Gyah.

In addition, the pesticides that besides chlorpyrifos also contain another active ingredient, such as Agrifos Super, Grand D, Nurelle D, Chance Plus, Ultimatum (chlorpyrifos with cypermethrin), and Hayla (chlorpyrifos with abamectin) were allowed to be imported as well.

As of 2020, the list of pesticides permitted for use in the Republic of Armenia includes more than 40 pesticides whose active ingredient is chlorpyrifos or chlorpyrifos is combined with another active ingredient.

Thus, the number of chlorpyrifos - containing pesticides has increased almost 3 times.

Table 1. Trade names of chlorpyrifos - containing pesticides approved for use in Armenia in 2020²

Agrifos	Sarban	Hayla	Agrichlor Extra ALS
Banzai 4	Dursban 48 % EC	Pyrinex Super	Chlorpyrifos 500 g/l+ Cypermethrin 500g/l
Agrifos 5 H	Mac Riphus	Scarlet +	Grand D
Demon	Chlorpyrifos Aria	Agrifos Super	Chlorpirivit Agro
Pyrinex	Banzai 30	Demon-D	Nurelle D, EC
Husban	Durfos	Don	Shaman
Uzban	Tayra	Ultimat	Agrifos Super 505
Robust	Fosban	Surello	Chlorpyrifos + Cypermethrin 45.8%
Fipro G	Agrifos 480	Ema CE	Cypermethrin+ Chlorpyrifos Gyah
Parus	Chance	Valsarel Elite	Chlorpyrifos 480 g/l

² <https://snund.am/%d5%a2%d5%b8%d6%82%d5%b5%d5%bd%d5%a5%d6%80%d5%ab-%d5%ba%d5%a1%d5%b7%d5%bf%d5%ba%d5%a1%d5%b6%d5%b8%d6%82%d5%a9%d5%b5%d5%a1%d5%b6-%d6%84%d5%ab%d5%b4%d5%ab%d5%a1%d5%af%d5%a1%d5%b6-%d6%87-%d5%af%d5%a5/>

Chlorsirin 550 CE	Chance Plus		
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It should be noted that in recent years the volumes of imports of chlorpyrifos-containing pesticides has increased: in 2018 it made up 95788 kg, in 2019 124360 kg, and in 2020 140572 kg. In other words, the import of chlorpyrifos in 2020 increased by 46.8% compared to 2018.

Unfortunately, the validity of the permit to use such pesticides is until 2025.

Figure 4 shows the volume of pesticides imported into Armenia in the last three years, in which chlorpyrifos was the active ingredient.

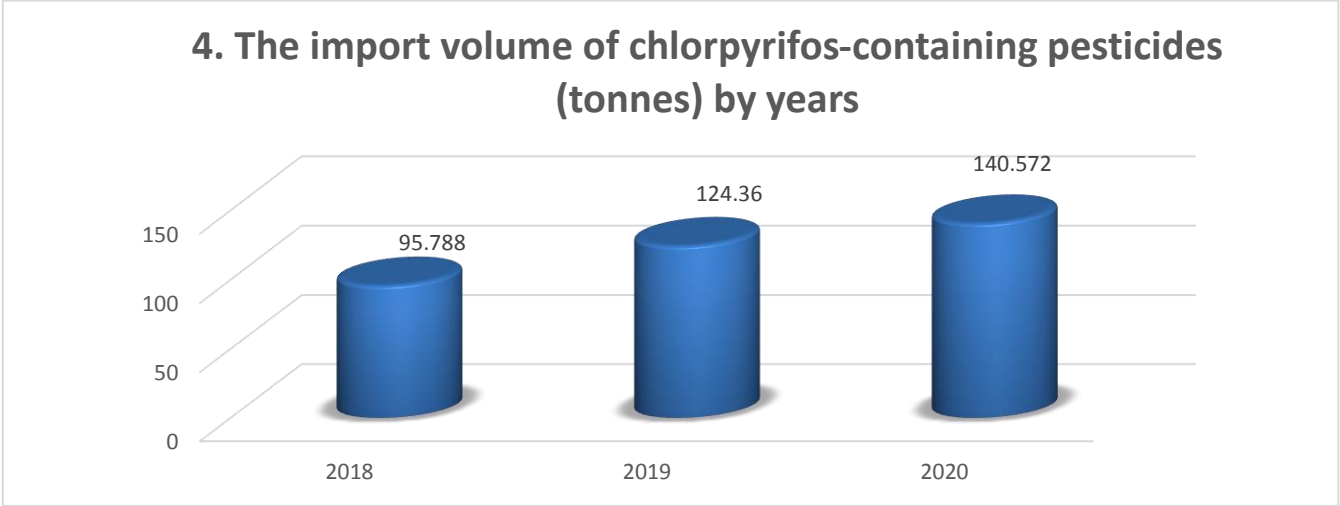
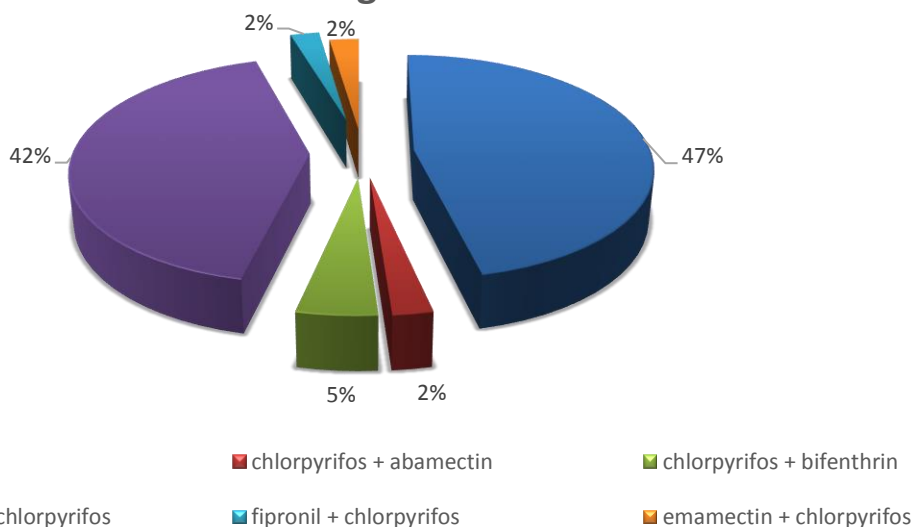


Figure 5 shows the amount of chlorpyrifos-containing pesticides permitted for use in Armenia in 2020, which has increased by 46.8% compared to 2018.³ In some cases, pesticides contain chlorpyrifos in combination with other active ingredients. Herbicides containing chlorpyrifos alone account for 47%, chlorpyrifos in combination with cypermethrin 42%, chlorpyrifos with bifenthrin 5%, chlorpyrifos with fipronil 2%, and chlorpyrifos with abamectin 2%.

³ Information provided by the Food Safety Inspection Body Of The Government Of The Republic Of Armenia

5. Herbicides imported to Armenia in 2020 containing chlorpyrifos or chlorpyrifos in combination with another active ingredient



The number of people engaged in agriculture in Armenia is high, and as far as pesticides, especially insecticides, are widely used for crop cultivation, so it can be concluded that the number of people who may be exposed to pesticides is also quite high.

It should be noted that chlorpyrifos-based preparations are permitted to be used to control a number of plant pests:

- sugar beet (aphids, meadow butterflies, long-horned beetles, moths, scales, carnivores);
- apple and other fruit trees (fruit moths, leaf rollers, moths, scales, cockroaches, ticks);
- grapes (grapevine moths);
- alfalfa (alfalfa longhorn beetles / *Phytonomus* /);
- pastures and wild vegetation (solitary locust species).

Chlorpyrifos and cypermethrin-based preparations are used against winter wheat ground beetles, apple-codling moth, leaf rollers, cockroaches, ticks, moths, and locusts.

This shows that the people who are engaged in horticulture and vegetable growing are certainly exposed to this dangerous herbicide. It should be noted that people working in greenhouses are 2-5 times more exposed to chlorpyrifos than those working in the fields or gardens.

Chlorpyrifos-based preparations are used for medical and household disinfection to control the following pests:

- red, black, American and other species of cockroaches (including stable populations);
- red ants in the houses and black garden ants, including in child care facilities, medical and public catering establishments.

Impact on human health

People can be exposed to chlorpyrifos as a result of inhaling it, swallowing it carelessly, coming into contact with the skin, or spilling it into the eyes, as well as eating food with hands contaminated with that pesticide. Chlorpyrifos has a devastating effect on the development of the human central nervous system, especially the child brain. Children and developing embryos are most exposed to the toxic effects of chlorpyrifos, which sometimes lead to irreversible consequences. Studies have shown that if a woman was exposed to chlorpyrifos during pregnancy, the baby at birth had low weight, smaller head circumference, later also operative memory loss, low mental development rate, hyperactivity, lack of attention, impaired self-control, speech disorders, inability to make decisions, autism. Chlorpyrifos has an embryotoxic-teratogenic effect, which is manifested by fetal growth retardation, as well as dilation of the cerebral ventricles, heart and lung hypoplasia. As a result of the effect of this pesticide, the child is observed to have underdeveloped skull bones and the absence of the last rib. Chlorpyrifos has the ability to accumulate in the body, as well as to be excreted in breast milk, urine and feces.

Morbidity cases recorded in Armenia

According to the 2017-2019 Report of the National Center for Disease Control and Prevention SNCO of the RA Ministry of Health on Infectious Diseases, Chemical Food Poisoning and Radiation, the number of poisoning cases in 2019 increased by 25.8% compared to 2017.⁴

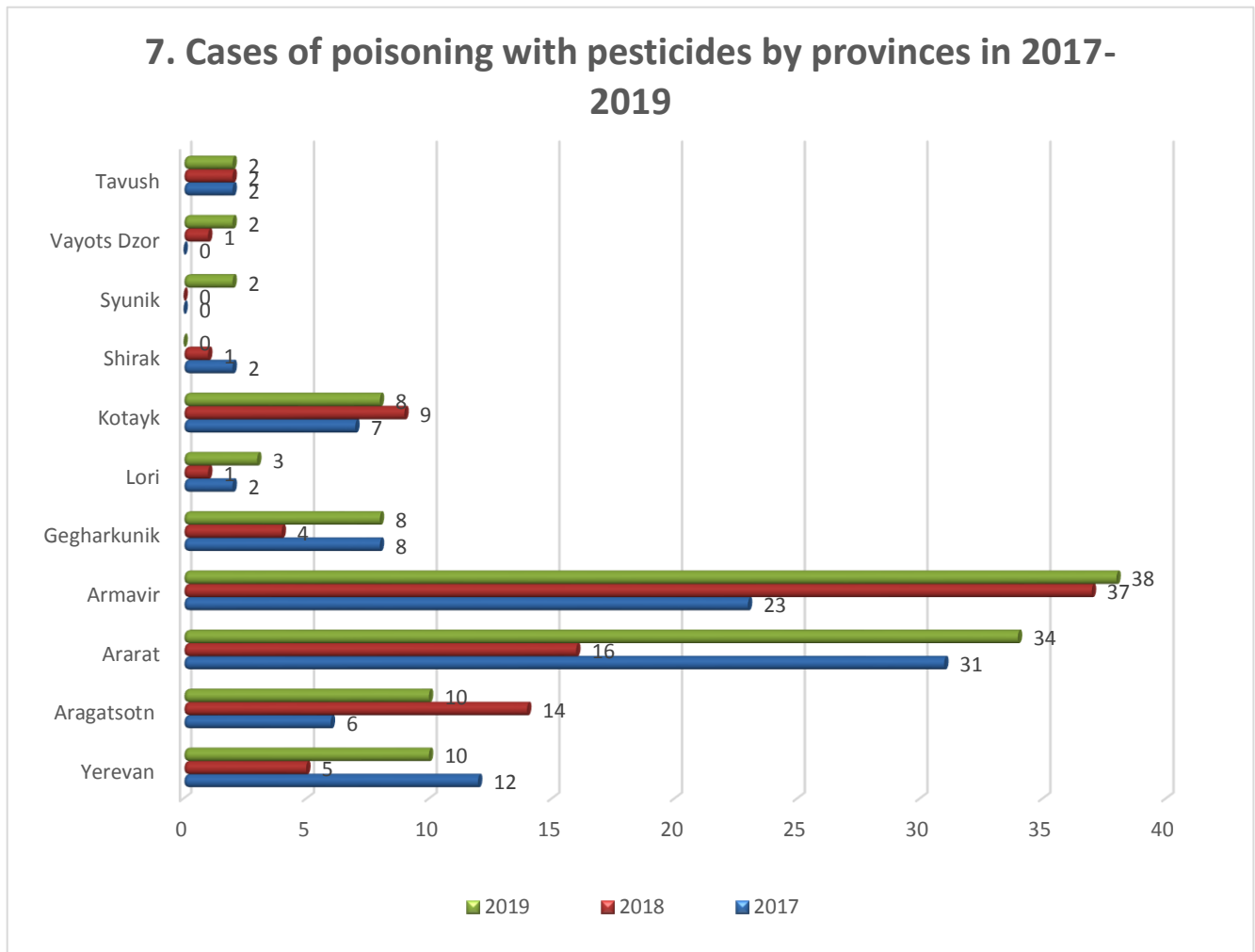
It should be noted that mainly severe and acute cases of pesticide poisoning are recorded. In lighter cases, pesticide workers do not seek medical help. Therefore, registration of some cases remain incomplete.

It is not always possible to determine the pesticide that has caused poisoning, as farmers purchase the pesticide in small quantities without labeling or discard the labeled pesticide package before spraying.

Some cases of pesticide poisoning were caused by pesticides not included in the list of pesticides permitted for use in the Republic of Armenia, which were apparently imported by individuals from other countries for personal use.

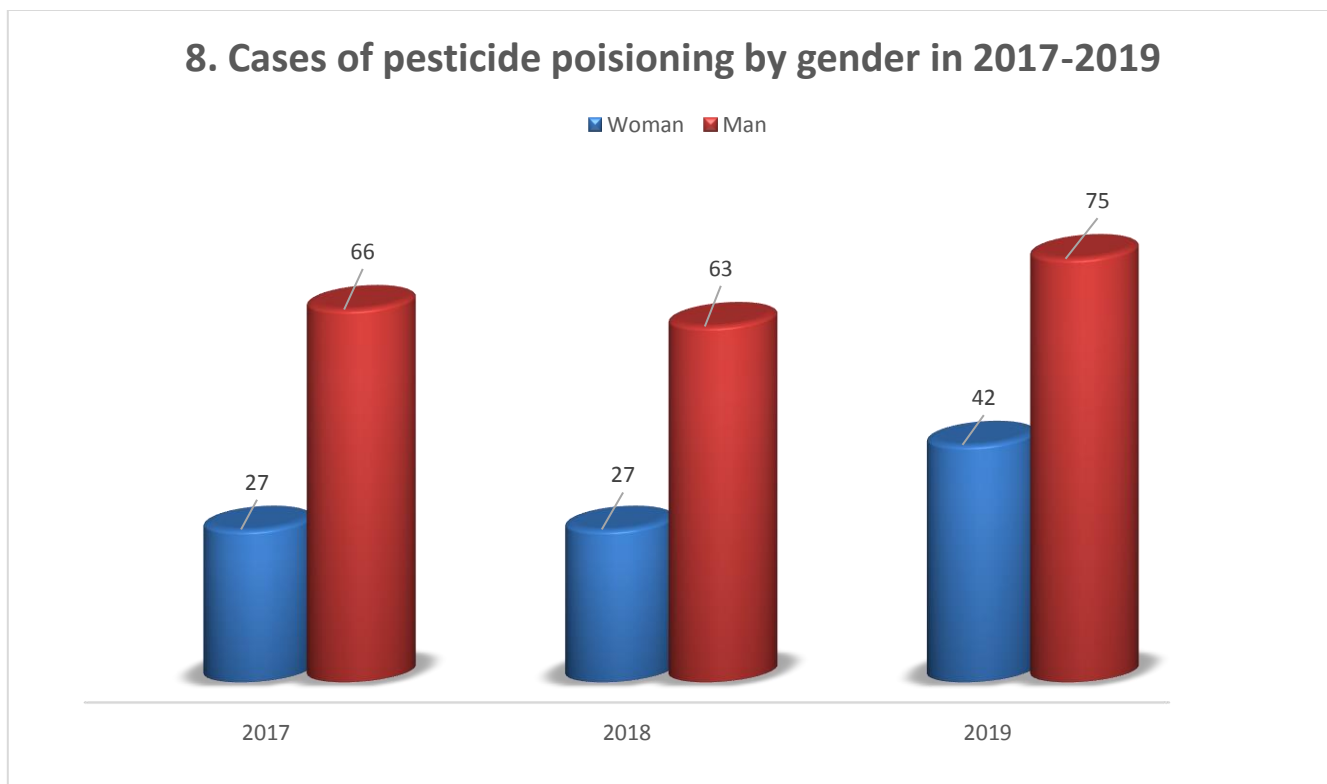
⁴ <https://ncdc.am/activity/newsletters/>

The most cases of poisoning were registered in 3 provinces, where the people are engaged in horticulture and vegetable growing. For example, in 2019, 38 cases of pesticide poisoning were registered in Armavir Province (32.5%), in Ararat Province - 34 cases (29.1%), in Aragatsotn Province - 10 cases (8.5%).



Based on the results of a number of discussions and surveys, it can be concluded that as far as men are more involved in crop cultivation than women, the incidence of pesticide poisoning is higher for men than for women. For example, in 2019, the incidence of poisoning among men was 64.1%, and among women - 35.1%.

8. Cases of pesticide poisoning by gender in 2017-2019



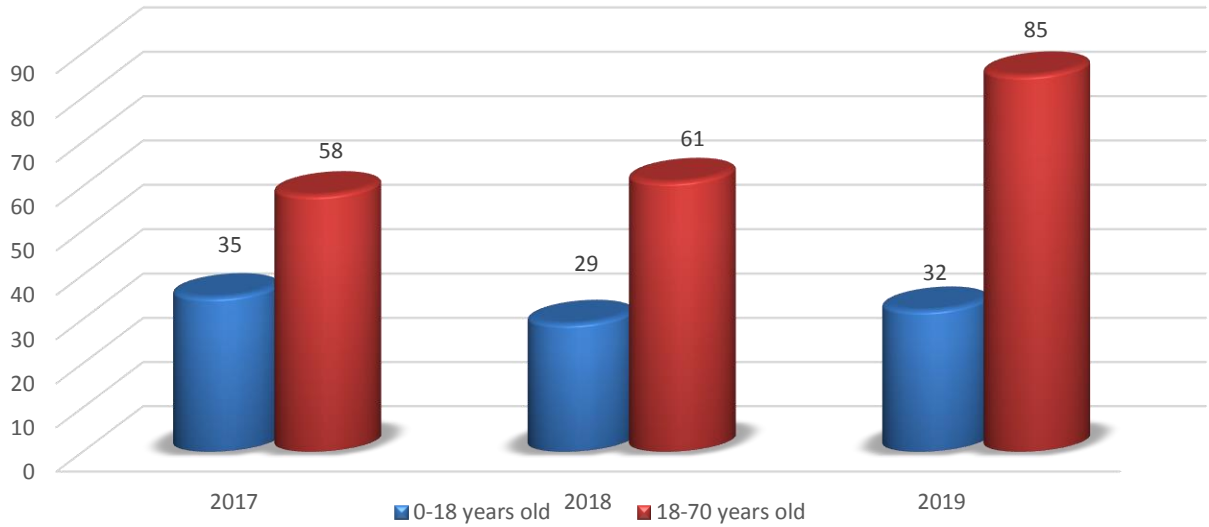
However, the possibility of poisoning in women should not be ignored, as the pesticides pass from the female body into the bloodstream and then into the developing fetus or the body of a breastfed baby. The latter will endanger the health of the fetus or baby.

Consequently, the women of reproductive age should not work with pesticides, which is stipulated by the RA Government Decision No. 1089-N of July 15, 2004 (On approving the procedure for conducting mandatory initial (upon employment) and regular medical examinations of the health condition of certain groups of the population affected by harmful and dangerous factors of the work process in the production environment, the list of factors, the nature of the work performed, the scope of the examination, the medical contraindications, and the procedure for the hygienic characterization of working conditions).

According to the general contraindications to work permits due to harmful and dangerous factors of the work environment, women during pregnancy, breastfeeding and stable menstrual disorders should not work with hazardous substances, in particular, with pesticides.

Analyzing the cases of pesticide poisoning by age groups, it was found that the most cases of pesticide poisoning were registered in adults working in the fields spraying pesticides. For example, in 2019, in the age group from 18 to 70, pesticide poisoning cases made up 72.6%. Cases of pesticide poisoning in the age group of 0 to 17 years should not be ignored, as in all children of this age the development of not all organ systems is over; any negative factor can cause irreversible anatomical or physiological changes.

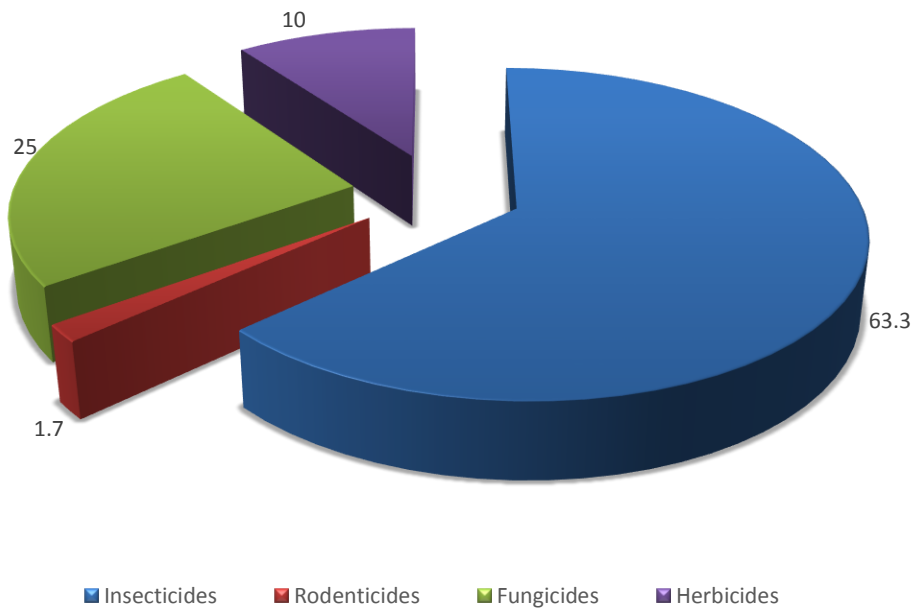
9. Cases of pesticide poisoning by age groups in 2017-2019



For example, due to the impact on the central nervous system, children have a low rate of mental development, poor operative memory, so they have low progress, have difficulty performing tasks on their own or it takes longer to complete tasks.

Figure 6 presents the cases of pesticide poisoning by the active ingredient of the pesticide.

6. Cases of pesticide poisoning due to the purpose



Most cases of poisoning are due to the use of insecticides, accounting for 63.3%. 29% of pesticide poisonings are caused by chlorpyrifos-containing pesticides. The content of chlorpyrifos in that pesticide is 480 g/kg.

Brief description of the situation in Armenia related to the use of chlorpyrifos and its impact

Agriculture is one of the most important sectors of the Armenian economy, providing employment for the majority of the rural population.

According to the list of imported herbicides registered in the Republic of Armenia in 2020, 40.5% of the imported pesticides are insecticides.

11.2% of insecticides are chlorpyrifos-containing insecticides.

In 2020, the number of pesticides containing chlorpyrifos permitted for use in Armenia (in tons) increased by 46.8% compared to 2018. In some cases, chlorpyrifos is combined with other active ingredients. Pesticides with chlorpyrifos alone make up 47% of this group, chlorpyrifos with cypermethrin 42%, chlorpyrifos with bifenthrin 5%, chlorpyrifos with fipronil 2%, chlorpyrifos with abamectin 2%, and chlorpyrifos with emamectin.

Chlorpyrifos has a devastating effect on the development of the human central nervous system, especially the baby brain. Children and developing embryos are most exposed to the toxic effects of chlorpyrifos, which sometimes lead to irreversible consequences. Studies have shown that if a woman was exposed to chlorpyrifos during pregnancy, the baby at birth had low weight, smaller head circumference, later operative memory loss, low mental development rate, hyperactivity, lack of attention, impaired self-control, speech disorders, inability to make decisions, autism. Chlorpyrifos has an embryotoxic-teratogenic effect, which is manifested by fetal growth retardation, as well as dilation of the cerebral ventricles, heart and lung hypoplasia. As a result of the effect of this pesticide, the child is observed to have underdeveloped skull bones and the absence of the last rib. Chlorpyrifos has the ability to accumulate in the body, as well as to be excreted in breast milk, urine and feces.

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The Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade was signed by Armenia on 11 September 1998, and ratified on 26 November 2003.

In order to limit the use of Highly Hazardous Pesticides and pesticide formulations in the Republic of Armenia, a list of banned pesticides and chemical substances, regulated by the Rotterdam Convention, was prepared and approved by the Decision of the Government of Armenia N 293-N of 17 March 2015. The list was updated on 8 September 2016 by the Decision of the Government of Armenia N 930-N. The list includes 44 chemical substances, including the pesticides that are banned for use to protect human health and the environment.