



CENTRAL ASIAN JOURNAL OF THEORETICAL AND APPLIED SCIENCES

Volume: 02 Issue: 12 | Dec 2021 ISSN: 2660-5317

Sanitation Environmental Health Pesticides and Environmental Pollution

Nur Efendi, Yasmi Antara, Wahyu Prasetyo A S, Abdul Razak, Eri Barlian, Indang Dewata, Mulya Gusman, Linda Handayani

Master Program of Environmental Sciences, Universitas Negeri Padang (UNP) – Indonesia

Received 22nd Oct 2021, Accepted 27th Nov 2021, Online 11th Dec 2021

Abstract: *The policy on the use of pesticides in their consumption in agriculture has many aspects that must be observed, such as the incidence of pests, when the right pest spraying is carried out, what dose is by the recommendations listed on the label, good and correct spraying methods, and so on. The original nature of this pesticide is extremely dangerous, so in its use must be very careful. Pesticides are very dangerous and can affect the functions of human organs. Toxins from pesticides can penetrate the tissues of the human body through 3 routes of entry, namely through the mouth (ingestion), respiratory tract (inhalation), skin. affect the level of human health. Some of the consequences of using pesticides in agriculture are: Risks for user safety in the form of direct pesticide contamination, chronic poisoning can give rise to indications of headaches, dizziness, nausea, vomiting and so on; The risk for consumers is in the form of poisoning residues (residual residues) of pesticides in agricultural products; Risks to the biotic environment in the form of risks to humans, animals, or plants in the area where pesticides are used; While the impact on the abiotic environment on the use of pesticides is that it can cause environmental pollution (soil, air, and water) with all its impacts. Approximately 40% of deaths in the world are caused by environmental pollution, including from plants consumed by humans, while of the 80 thousand types of pesticides and other chemicals used, almost 10% are carcinogenic or can cause cancer. Cancer research also mentioned that 1.4 million cancers in the world are caused by pesticides.*

Key Words: *Pesticides, Environment, Health Environment, Pollution.*

INTRODUCTION

The agricultural environment needs attention, especially the health of its workers. Aspects of health risks in the environment need equal action. Cases that are often found, especially in the agricultural sector, and lead to workers who cannot be separated from the use of pesticides (Nash, 2004). Pesticides are a technological transformation used in agricultural land. The technological transformation involved in the agricultural sector is directly related to the transformation of health risks. According to Nelson et al (1994) technology changes along with the growth of the times. Where hoeing technology is replaced by the application of tractors, eradicating pests with predators is replaced by using pesticides which will affect the health risk aspects experienced.

The policy on the use of pesticides in their consumption in agriculture has many aspects that must be observed, such as the generation of pests, when the proper pest spraying is carried out, how many doses are by the recommendations listed on the label, good and correct spraying methods, and so on. Pesticides

are the main choice used to eradicate organisms, because pesticides have a strong toxic energy, their use is very easy and the results are fast (Lehotay et al, 2005).

The original nature of this pesticide is extremely dangerous, so in its use must be very careful (Plianbangchang, 2009). Pesticides are very dangerous and can affect the functions of human organs (Mehrpour et al, 2014). Toxins from pesticides can penetrate human body tissues through 3 routes of entry, namely through the mouth (ingestion), respiratory tract (inhalation), skin. Pesticides in gaseous form are harmful to human respiration, whereas pesticides in liquid form are harmful to the skin because they can enter through the pores. Using pesticides in excessive doses is at risk of causing symptoms of poisoning from pesticides, namely nausea, headaches, vomiting, and there is also irritation on the skin (Tijani, 2009).

Based on information from the World Health Organization (WHO), at least 250,000 deaths due to pesticide poisoning occur each year. Approximately 5,000-10,000 people experience health effects such as cancer, infertility, birth defects, and hepatitis, especially in agricultural zone workers. Pesticide is a substance that contains toxic properties that are at risk of being irritant and can also cause corrosiveness in which the use of pesticides must be done wisely and by proper procedures. Research by Kishi et al (1995) shows that 76% of pesticide poisoning problems are work-related. The research results of Budiawan (2013) are known that after spraying farmers often groan because of exposure to pesticides due to not wearing a mask when spraying. The risk of poisoning can be minimized if the attitudes and work methods are known. The use of pesticides is not good because aspects of behavior, knowledge and actions of using pesticides are still low (Damalas & Koutroubas, 2017). The impact when experiencing chronic poisoning is not immediately felt so it is difficult to detect (Brown & Brix, 1998). Pesticides as one of the toxic and dangerous chemicals, should have a guide on the label of each packaging so that it can be used comfortably and healthily.

METHODS

The author uses the method of writing a literature study for this article.

FINDINGS

Sanitation is an effort or action regarding public or population health that focuses on monitoring various aspects of the environment that can affect the level of human health. The interpretation of Environmental Health is "an effort to protect, manage, and modify the environment aimed at balancing the ecology at the level of human welfare that continues to increase". Pesticides are substances or chemical compounds, regulatory substances and body stimulants, other materials, and microscopic organisms or viruses that are used for protection for plants. Based on the Regulation of the Minister of Agriculture of the Republic of Indonesia No 107/2014 concerning Pesticide Control, what is meant by pesticides are all chemical substances and other materials and microorganisms and viruses that are used to eradicate or prevent pests and diseases that interfere with plants, plant parts or products, agricultural products, eradicating grass, turning off leaves and preventing unwanted growth, controlling or triggering the growth of plants or plant parts including fertilizers, eradicating or avoiding wild pests in pets and livestock, eradicating or preventing animals or microorganisms in households, buildings and in means of transportation, eradicate or prevent water pests, eradicate or prevent animals that can cause disease in humans or fauna that need to be protected by use on plants, soil or water.

Organochlorine pesticides are chemical substances that are included in the type of Persistent Organic Pollutants (POPs) which have risks to the health of living things and their environment (El-Shahawi et al, 2010). The use of organochlorines in the long term causes persistence in soil, animal bodies, and plant tissues, the main accumulation in fat tissue. Organochlorines can cause cancer, allergies and disrupt the

nervous lining, and can disrupt the endocrine system which causes damage to the reproductive system and immune system in living things, including the womb. Cholinesterase inhibitor pesticides are widely used in agriculture as an insecticide to replace pesticides among organochlorines. The pesticides listed in this pesticide are organophosphates and carbamates.

Djojsumarto (2000), agricultural pesticides are usually chemicals or a combination of chemicals and other materials (plant extracts, microorganisms, and so on). Used to regulate plant-disturbing organisms. Therefore, pesticide compounds are bioactive. That is, pesticides with many methods affect life, for example stopping development, killing pests/diseases, suppressing weeds, repelling pests, influencing/controlling plant development, drying/dropping leaves. So pesticides are poisons. Every poison always has a risk in its use.

Some of the consequences of the use of pesticides in agriculture are: 1) The risk to user safety is in the form of direct pesticide contamination which can cause poisoning, either serious or chronic. Chronic poisoning can cause headaches, dizziness, nausea, vomiting, and so on. Some pesticides can cause skin irritation, moreover can cause blindness; 2) The risk for consumers is in the form of poisoning residues (residual residues) of pesticides in agricultural products. The effect for consumers can be in the form of direct poisoning due to eating agricultural products contaminated with pesticides or through the food chain; 3) Risks to the environment can be classified into 3 groups as follows: Risks to humans, animals, or plants that are in place. Risk to people, animals, or plants that are in, or around where pesticides are used; and 4) The effects on the environment that are produced by pesticides can cause environmental pollution (soil, air, and water) with all their impacts.

Factors affecting pesticide poisoning 1) Age, along with increasing age, the body's metabolism continues to decrease and the activity of blood cholinesterase decreases so that it will facilitate the formation of pesticide poisoning; 2) The health status of the application of pesticides when the body is in an unhealthy condition facilitates the formation of pesticide poisoning; 3) Level of knowledge, good knowledge is expected by spraying farmers can carry out pesticide action properly, so that the risk of poisoning can be avoided; 4) Environmental temperature is related to the time of spraying, the sun continues to get hotter or continues to become noon until the temperature is about to continue to be high, then this situation will affect the impact of pesticides through the absorption mechanism through the skin caused by the pressure of hot temperatures when spraying pesticides; 5) The use of personal protective equipment for farmers during pesticide action is very important to avoid direct contact with pesticides; 6) The working period continues to be a long time for farmers to be sprayers so that they continue to be in contact with pesticides for a long time so that the risk of poisoning from pesticides continues to be large; 7) The frequency of spraying affects the poisoning effect of pesticides because continuous spraying often causes a higher poisoning effect to be caused. Spraying should be carried out with terms and conditions; 8) Good spraying is carried out in the direction of the wind and the sprayer should change the spraying position when the wind direction changes. Because wind direction can affect the spread of pesticides that will be sprayed to minimize the spread of poison to farmers who are carrying out activities; 9) When spraying, it is necessary to pay attention to the ambient temperature which can cause more sweat, especially during the day, so spraying during the day will make it easier for pesticide poisoning to form through the skin. The best time for spraying is morning or evening; 10) Improper personal hygiene can cause pesticide poisoning, this can be minimized by bathing or washing hands after carrying out activities related to pesticides, uncut fingernails are also one of the causes of poisoning by farmers or individuals due to residual toxins that are still present. left between the fingers and long nails; and 11) A leaky sprayer or sprayer can cause the skin to be exposed to pesticides so that the skin can be poisoned. Such as the appearance of itching on the skin, redness of the skin, or skin irritation.

The following are some of the consequences of using pesticides related to the environment and ecosystem. 1) Extinction of Species, pollutants that pose a risk to aquatic and terrestrial biota. Various types of animals face poisoning and then die. Different animal species have different immunity. Some are sensitive, some are resistant. Young animals and larvae are animals that are sensitive to pollutants. Some animals can adapt so that they are immune to pollutants and some are not. Although animals can adapt, it must be recognized that the level of adaptation of animals has a limit. If this limit is exceeded, the animal will die; 2) Pollution of water and soil. In the aquatic environment, water pollution by pesticides is mainly caused by the flow of water from places of human activity that use pesticides to increase the production of agriculture and animal husbandry; 3) Air pollution caused. Pesticides that are sprayed quickly can mix with the air and are directly exposed to sunlight. Pesticides also fly to the wind. The finer the grain of the solution, the greater the possibility of percolation and the farther away the wind current is flying; 4) New pest species are emerging that are resistant so that the pest species to be eradicated may become tolerant to pesticide poisons, resulting in uncontrolled growth of the new pest population. It can be concluded that the number of pests that died was very few or there were no pests that died even though spraying activities were carried out. Even though it has been sprayed with a reasonable dose of pesticide or even a larger dose; and 5) The emergence of new pest species or secondary pest explosion. The use of pesticides that are intended to eradicate certain types of pests moreover can cause the emergence of other types of pests. The explosion of these secondary pests can occur some time after the use of pesticides, or at the end of the season.

Some of the impacts that can be caused by the use of pesticides on human health and pollution of the environment, either directly or indirectly when associated with the basic nature of the chemicals (Djojsumarto, 2000): 1) Organochlorines (OK) It is a contact poison and stomach poison that can harm the environment and the health of residents due to its persistence for a long time in the environment, be it in soil or plant tissue as well as in animal bodies. Herbicide compounds 2, 3, 7, 8- TCDD are toxic compounds for livestock including humans, enter through skin contact or the digestive tract, induce oxidase enzymes, strong carcinogens, teratogenic, and suppress the immune response. The toxicity of this organochlorine group is as an anesthetic, narcotic and systemic poison. Its specific working method is as a central nervous system depressant (narcosis), liver tissue damage, and kidney tissue damage; 2) Organophosphates (OP): Is a contact poison, stomach poison, or fumigant. Toxicity due to exposure to this compound affects the nervous system through the inhibition of the cholinesterase enzyme; and 3) Carbamate Like the organophosphates, their toxicity is by inhibiting the activity of the cholinesterase enzyme in the nervous system.

In the Concept pesticide function as a component of pest control (Feder & Regev, 1975). Pesticides rapidly reduce pest populations so that widespread infestations can be prevented, and crop failures can be prevented. However, the benefits of obtaining agricultural products are not without consequences. One of the most common triggers of disease and premature aging in humans is the many chemicals found in our area (Jackson & Bartek, 2009), as well as genetic engineering that is always carried out on the cultivation of non-organic foodstuffs illustrates one of the causes. % of deaths in the world are caused by environmental pollution, including from plants that are consumed by humans, while of the 80 thousand types of pesticides and other chemicals used, almost 10% are carcinogenic or can cause cancer. Cancer research also mentioned that 1.4 million cancers in the world are caused by pesticides.

The use of pesticides is very detrimental to the health of farmers and the environment (Wilson & Tisdell, 2001). Due to the activities of thousands of farmers who are faced with the use of pesticides in agricultural activities every day. Farmers are poisoned by pesticides where it can be estimated that every year there are millions of people who participate in agriculture who suffer from poisoning due to the use of pesticides. In some cases of pesticide poisoning, farmers and workers on other farms are contaminated

(exposed) to pesticides in the process of combining and also in the process of spraying pesticides (Wilson & Tisdell, 2001). In addition, residents living near agricultural areas may be in danger of being contaminated with pesticides through polluted air, soil, and water, especially consumers through agricultural products that use pesticides. Of the most cases that occur due to the danger posed by the use of pesticides to the safety of human life and health, it is very surprising. Research from the WHO and the United Nations estimates that 3 million people who work in agricultural zones in developing countries are exposed to pesticides and close to 18,000 people die each year (Heber & Miller, 2004).

Management of pesticides has a goal so that humans are free from poisoning and pollution caused by pesticides (Abdollahi et al, 2004). Some of the management actions that should be taken to avoid poisoning and pollution by pesticides are the management of storage, disposal, and destruction of pesticide waste. 1) Pesticides are placed in their original packaging, do not be transferred to other containers, especially containers that are commonly used to store food or drinks; 2) Pesticide waste is generally in the form of residual pesticides located in packages. Improper disposal can not only pollute the area but is the ability for people to be indirectly exposed to pesticides; 3) The process of burning the pesticide container must be carried out in a place far from the house or residential area to avoid the inhalation of polluting smoke generated from the heat of the combustion; 4) Disposal of garbage or pesticide waste should be mandatory in a special place, not in a landfill or general waste. The location for the disposal and destruction of waste or pesticide waste is recommended to be far from residential areas and a special place must be provided so that it does not pollute the environment; and 5) The pesticide burial place must be located far from water sources, wells, fish ponds and drinking water canals (100m or more).

CONCLUSIONS

The danger of pesticide contamination in agricultural products can cause negative impacts on many people. Prevention activities to prevent pesticide contamination of food can be carried out through campaigns and counseling about reducing excessive use of pesticides on agricultural land. Integrated pest control can be achieved by using a minimum of pesticides, according to needs. In the case of integrated pest control, the most effective way to do this is by looking at agriculture as an ecosystem, with the main objective being to avoid the growing number of pests that will later be useful for insecticides to minimize the ecological disturbances of predators and parasites preying on agricultural insect pests. In every activity of using pesticides, good and correct planning and management steps must be carried out to minimize the possibility of humans and the environment being polluted by toxic pesticides. This includes regulations concerning the control and use of pesticides in the agricultural sector.

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