

## **EFFECTS OF PESTICIDES ON HUMAN HEALTH AND THE ENVIRONMENT**

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### **Abstract**

Generally, the agents or anything that kills insects are called insecticides. Pests are organisms, may be animals or plants, that are harmful to humans or human beings that depend on them, including crops, livestock, and other food-providing enterprises. Man has to compete with these insects to live a healthy life and also to save his food on which he is dependent. Chemicals used to kill or keep away these pests are called chemical pesticides. Microbes, Fungi, Viruses, Organisms like Mycoplasma, Amoeba which are major pests that can cause life threatening effects on other living organisms including humans, plants, insects and animals. Insects are directly attacking other organisms for their food and are also considered as serious pests. These insects have the ability to spread deadly diseases from diseased to healthy. As. Mosquitoes, plant hoppers, fruit borers etc. Plants that are of no use to mankind are also sometimes considered pests, even though they may be food for livestock. Chemical pesticides are those chemicals that can be used to kill pests either directly or indirectly.

The broad range of negative impacts of applying pesticides are referred to as the environmental effects of pesticides. One of the primary causes of the detrimental effects of modern industrial agriculture on the environment is the inadvertent use of pesticides. Pesticides can harm non-target species like plants, animals, and people since they contain poisonous compounds designed to kill pest species. When they are sprayed or distributed throughout entire agricultural areas, more than 98% of sprayed insecticides and 95% of sprayed herbicides end up somewhere other than their intended target species. Other agricultural chemicals, including fertilisers, may also harm the ecosystem.

**Keywords:** Humans, Plants, Insects, Animals, Mosquitoes

## **Introduction**

Whenever there is talk of the development of the country, there is definitely a mention of the Green Revolution. This mention is also imperative, because the country became self-sufficient in true sense only after the Green Revolution. Agricultural production has increased in the country, but there is another dark side of the Green Revolution, which is slowly coming to the fore. As we know, during the Green Revolution, our policy makers promoted such an agricultural system in the country, which consumes a lot of water, besides chemical fertilizers and pesticides. In the greed of higher yield, the farmers also adopted it voluntarily. Till yesterday, the farmer who used natural fertilizers in farming, started using chemical fertilizers and pesticides. It is obvious that agricultural production has also increased due to this, but the farmers had never thought even in their dreams that these chemical fertilizers and pesticides will later absorb the fertility of their land. Saini, P., & Kumar, M. (2012).

The use of chemical fertilizers and pesticides not only reduced the fertility of the land, but also had a bad effect on the health of the farmers and agricultural laborers. Many serious diseases, including cancer, developed among the farmers due to the contact with pesticides and their dangerous effects on the crops. Since Punjab was most affected by the use of chemical fertilizers and pesticides, it had to bear the brunt of it. In the last few years, a large number of farmers are falling prey to cancer in Bathinda, Faridkot, Moga, Muktsar, Ferozepur, Sangrur and Mansa districts of Punjab. Studies conducted by the Center for Science and Environment, PGI Chandigarh and Panjab University, including the government itself, have revealed the fact that the spread of cancer has reached an alarming level in these districts due to excessive use of pesticides. Pereira, L. C., & Dorta, D. J. (2015)

When this news came continuously in the media, the National Human Rights Commission took suo moto cognizance of this and directed the state government to take necessary action. It was the result of media pressure and the direction of the Human Rights Commission that the Punjab government has now banned the use, production and import of pesticides, which are proving to be hazardous to health, within the state. This restriction was also necessary. If these pesticides were not banned, the range of affected farmers would have increased. It is not without reason that out of 5,000 farmers and agricultural laborers who committed suicide in Punjab between

2000 and 2010, 3,000 people are from only two districts of Bathinda and Sangrur. Farmers suffering from incurable diseases are embracing death to save their families from financial crisis. Gul, A., & Hakeem, K. R. (2016)

The need to curb the indiscriminate use of pesticides in agriculture has been felt for a long time. In view of this, the government also banned some pesticides in view of their dangerous effects, but still their use did not stop. As much pesticide is used to protect the crop from disease, very little of it is used for its actual purpose. A large part of it reaches our various water sources and pollutes the ground water. The condition is that due to seepage of these chemicals in the ground, the ground water of many places has become extremely poisonous. Not only this, these chemicals later flow into the rivers and ponds as well, which is affecting the water-creatures and animals-birds as well. Different types of diseases are arising in these. Eating crops using pesticides not only affected human health, but also affected animals, birds, insects and the environment. Sharma, N., & Singhvi, R. (2017).

Despite all this, there is not an iota of willpower in the government to take some specific steps to stop or limit the use of pesticides. Do something that discourages the use of pesticides. Whenever the issue of health hazards arising out of the indiscriminate use of chemical fertilizers and pesticides arises, it is argued that a ban on the same will reduce the yield. The country's food security will be affected, but on what condition more production is being achieved, it is deliberately ignored. Food security does not mean increasing production in any way. Food should be such that it is good for health as well. Bhardwaj, T., & Sharma, J. P. (2013). Excessive use of chemical fertilizers and pesticides is not only affecting the health of humans and animals, but also reducing the fertility of the land. Now the time has come for the government to review its agricultural policies. Correctly assess the advantages and disadvantages of the modern farming system. There should be an initiative by the government to control the use of pesticides and promote such methods of farming, which are friendly to both health and environment, only then the fields and the farmers will be safe.

### **Effects of chemical pesticides**

Chemical insecticides can kill pests when sprayed or applied due to their toxic nature. They can be fumigants that have a direct effect on the respiratory organs, organochlorines, pyrethroids,

stomach poisons that can kill insects. Pesticides are chemical compounds used to control fungi and animals. Nonetheless, because of their application technique in the farming fields, an average of 95% reaches other organisms other than the targeted pests. For example, overflow can transport pesticides into bodies of water, while breeze can transport them to other areas such as human settlements and grazing areas, potentially affecting other animals. Van der Werf, H. M. (1996).

All over the world, chemical pesticides are being sprayed indiscriminately in the fields to protect the agricultural produce from the damage caused by insects. India is also not behind in this; excessive use of pesticides is proving harmful not only for mankind but also for the environment. According to reports, pesticide companies are earning billions of dollars every year by selling pesticides that harm human health and the environment. Pingali, P. L., & Roger, P. A. (Eds.). (2012).

Pesticides and other agricultural chemicals are more dangerous for the environment than they are for human health. At present, the use of agro-chemicals is proving extremely dangerous for environmental protection. The green revolution which we opened with the help of agrochemicals, today its side effects have started coming to the fore, in the process of extracting more and more food grains from the land, we pour about 25 billion pounds of pesticides on the ground every year around the world. The number of chemical fertilizers is many times more than this. In the last three to four decades, these agricultural chemicals have changed the nature of agricultural land.

After 3 years of independence i.e. in 1950, where 2000 tonnes of pesticides were consumed in our country, now this consumption has increased to 90 thousand tonnes. In the 60s, where pesticides were sprayed in 6.4 lakh hectare in the country, now pesticides are being sprayed in 1.5 crore hectare area. The surprising thing is that dangerous pesticides are causing more damage to developing and poor countries than to developed countries. About 59 percent of dangerous pesticides are being used in our country. Whereas in Britain it is only 11 percent. Forget, G. (1993).

The saddest thing is that the quantity of pesticides used in the grains, vegetables, fruits and other agricultural products produced in our country has been found to be more than the

prescribed standards. Pesticide residues in Indian food items are up to 20 percent, while at the global level it is only up to 2 percent. Only 49% of the food products in our country are free of pesticide residues.

Today, through agricultural chemicals, we get agricultural produce manifold. But have we thought that the production of agriculture will increase or decrease in the coming times? Are the products obtained through agrochemicals that much better in terms of nutrition? Have you ever wondered to what extent these chemicals are polluting the underground water and the water bodies of the rivers? Environmentalists keep raising such questions every day, but no one pays more attention to this, but in the coming times these questions will echo in our ears every day. Amaraneni, S. R. (2018).

Chemical fertilizers extract a large amount of minerals found in the soil. Obviously, excessive exploitation of these minerals deprives the soil of these minerals and over time this land turns into barren land. It happens. Normally agricultural land is full of many types of beneficial bacteria, bacteria, earthworms etc. With the help of these bacteria, bacteria and earthworms, the cycle of minerals keeps on rotating in the soil, and even after repeated farming, the ecological balance of the soil remains. But chemical fertilizers and chemical pesticides not only exploit the mineral substances from the soil at a rapid pace and make it barren, but also destroy the beneficial biological substances from there and destroy the ecological balance there.

Important micronutrients are also lost from the soil due to agricultural chemicals. After the use of chemical nitrogen fertilizers, rapid erosion of potassium starts from the land. The use of super phosphate causes the deficiency of copper and zinc. According to agricultural scientists, after the use of nitrogen, phosphorus and potash fertilizers, the amount of protein in food grains decreases by 20 to 25 percent. The increasing amount of carbohydrates in this chemical fertilizer food grains is a symbol of the fact that how much nutritious food we are producing?

**Chemical pesticides will simultaneously have side effects on humans and other living beings.**

The effects of chemical pesticides have short- and long-term effects. Short-term effects such as headache, shortness of breath, nausea, and long-term effects such as cancer, impaired function of the reproductive system, and genetic disorders. Özkara, A., Akyıl, D., & Konuk, M. (2016).

The major effect of chemical pesticides used to kill insects is not complete spoilage and many times they remain in the atmosphere, soil and water bodies and can seriously pose a health hazard to other organisms which actually they are not pests and sometimes they are beneficial too. The indiscriminate use of pesticides on crops can result in toxic material on fruits and vegetables, rendering them unfit for consumption, another effect of the use of chemical pesticides.

### **Pesticides contribute to air pollution**

Pesticide drift causes pesticides to become suspended in the air and move when the wind blows, potentially polluting the air. Pesticides applied to plants are easily volatile and can be blown away to nearby areas, posing a risk to wild animals and people living in such areas. Pesticides that are applied in the form of powder can be carried by the wind to other areas. The relative humidity and temperature at the time of application contribute to pesticide spread in the air; thus, the more the wind blows, the more they spread, and vice versa. Bihari, V., Mathur, N., & Srivastava, A. K. (2009)

### **Effects of Pesticides on Human Health and the Environment**

Pesticide exposure can occur in a variety of ways, including agricultural activities such as crop treatment, planting, and grain storage. It can also happen while gardening, forestry, skilled and domestic pest control, spraying, and using facilities such as parks, playgrounds, and pavements. Exposure may also occur during the preservative treatment of woods, the treatment of livestock, and the hulling of boats. Because of the various modes of application, pesticides remain in the environment and are, for example, found in our foods, putting people's lives in danger.

Pesticides can thus have dangerous and deadly consequences even after a single consumption, breathing, or skin contact. There are even symptoms that can appear shortly after exposure to the chemicals. Another difficulty is that a person who is harmed by chemicals may be harmed when the pesticide interacts with other poisonous substances to which people are exposed. Every day, people are exposed to a cocktail of pesticides, and no one knows what the long-term effects of even low-level pesticide exposure will be. It can frequently lead to decreased

physical activity and changes in the normal functioning of certain body organs. Sharma, N., & Singhvi, R. (2017).

### **Conclusion**

Today, the taste of vegetables and fruits is completely different in farming done through chemical fertilizers, the main reason for this is the lack of these nutritious elements in it. These chemical fertilizers increase the size of the products by increasing the amount of carbohydrates, but they change their natural form only. The stored vegetables start spoiling soon, the reason for this is also the presence of agricultural chemicals in them. This is the reason why a section of intellectuals is so skeptical about the use of these agrochemicals that they have started talking about timely alternatives to these agrochemicals, whereas in the survey of pesticide management in 2018 by the World Health Organization and the United Nations Food and Agriculture Organization Found that there are several serious shortcomings. Countries should make stricter regulations to reduce the harmful effects on the environment and humans.

Agricultural chemicals are directly affecting human health and the environment. Only one percent of the total pesticide sold by five big companies reaches the target, the remaining 99 percent is mixed in air, water and soil. It pollutes it. Due to agricultural chemicals, lakhs of tones of pesticides are mixed in the rivers every year. Due to these toxic agricultural chemicals, a large number of fishes and other sea creatures get absorbed in the cheeks of untimely times. The problem of water pollution due to pesticides is increasing day by day. Every year about 2 lakh suicides in the world are due to toxic pesticides, while in the last three years 5114 farmers have died while spraying pesticides in the field.

Due to the way agricultural chemicals are harming the public health, environment and ecosystem, today a large number of farmers of western countries have left scientific farming and started adopting century's old ancient agricultural system. The result of tampering with nature is complete today. Human society is feeling. Don't know when we will start adopting our ancient agricultural method back, which is the only option to restore clean environment, public health and balanced ecosystem.

## References

1. Abong'o, D., Wandiga, S., Jumba, I., Madadi, V., & Kylin, H. (2014). Impacts of pesticides on human health and environment in the River Nyando catchment, Kenya. *International Journal of Humanities, Arts, Medicine and Sciences*, 2(3), 1-14.
2. Abong'o, D., Wandiga, S., Jumba, I., Madadi, V., & Kylin, H. (2014). Impacts of pesticides on human health and environment in the River Nyando catchment, Kenya. *International Journal of Humanities, Arts, Medicine and Sciences*, 2(3), 1-14.
3. Alewu, B., & Nosiri, C. (2011). Pesticides and human health. *Pesticides in the modern world—effects of pesticides exposure. InTech*, 231-50.
4. Amaraneni, S. R. (2018). Potential impact of pesticides on environment and human health. *Chemistry International*, 40(3), 46-48.
5. Bernardes, M. F. F., Pazin, M., Pereira, L. C., & Dorta, D. J. (2015). Impact of pesticides on environmental and human health. *Toxicology studies-cells, drugs and environment*, 195-233.
6. Bernardes, M. F. F., Pazin, M., Pereira, L. C., & Dorta, D. J. (2015). Impact of pesticides on environmental and human health. *Toxicology studies-cells, drugs and environment*, 195-233.
7. Bhardwaj, T., & Sharma, J. P. (2013). Impact of pesticides application in agricultural industry: An Indian scenario. *International Journal of Agriculture and Food Science Technology*, 4(8), 817-822.
8. Cohen, M. (2007). Environmental toxins and health: the health impact of pesticides. *Australian family physician*, 36(12).
9. El-Nahhal, Y., & Radwan, A. (2013). Human health risks: Impact of pesticide application. *Journal of Environment and Earth Science*, 3(7), 199-209.
10. Fantke, P., Juraske, R., Antón, A., Friedrich, R., & Jolliet, O. (2011). Dynamic multicrop model to characterize impacts of pesticides in food. *Environmental science & technology*, 45(20), 8842-8849.



11. Forget, G. (1993). Balancing the need for pesticides with the risk to human health. In *Impact of pesticide use on health in developing countries: proceedings of a symposium held in Ottawa, Canada, 17-20 Sept. 1990*. IDRC, Ottawa, ON, CA.
12. Hernández, A. F., Parrón, T., Tsatsakis, A. M., Requena, M., Alarcón, R., & López-Guarnido, O. (2013). Toxic effects of pesticide mixtures at a molecular level: their relevance to human health. *Toxicology*, 307, 136-145.
13. Kesavachandran, C. N., Fareed, M., Pathak, M. K., Bihari, V., Mathur, N., & Srivastava, A. K. (2009). Adverse health effects of pesticides in agrarian populations of developing countries. *Reviews of environmental contamination and toxicology Vol 200*, 33-52.
14. Kumar, N., Pathera, A. K., Saini, P., & Kumar, M. (2012). Harmful effects of pesticides on human health. *Annals of Agri-Bio Research*, 17(2), 125-127.
15. Mahmood, I., Imadi, S. R., Shazadi, K., Gul, A., & Hakeem, K. R. (2016). Effects of pesticides on environment. *Plant, soil and microbes: volume 1: implications in crop science*, 253-269.
16. Mahmood, I., Imadi, S. R., Shazadi, K., Gul, A., & Hakeem, K. R. (2016). Effects of pesticides on environment. *Plant, soil and microbes: volume 1: implications in crop science*, 253-269.
17. Margni, M., Rossier, D., Crettaz, P., & Jolliet, O. (2002). Life cycle impact assessment of pesticides on human health and ecosystems. *Agriculture, ecosystems & environment*, 93(1-3), 379-392.
18. Özkara, A., Akyıl, D., & Konuk, M. (2016). Pesticides, environmental pollution, and health. In *Environmental health risk-hazardous factors to living species*. IntechOpen.
19. Pelosi, C., Barriuso, E., Bedos, C., Benoit, P., Mamy, L., & Mougin, C. (2017). Fate and impact of pesticides: new directions to explore. *Environmental Science and Pollution Research*, 24, 6841-6843.
20. Pingali, P. L., & Roger, P. A. (Eds.). (2012). *Impact of pesticides on farmer health and the rice environment* (Vol. 7). Springer Science & Business Media.

21. Sharma, N., &Singhvi, R. (2017). Effects of chemical fertilizers and pesticides on human health and environment: a review. *International journal of agriculture, environment and biotechnology*, 10(6), 675-680.
22. Sharma, N., &Singhvi, R. (2017). Effects of chemical fertilizers and pesticides on human health and environment: a review. *International journal of agriculture, environment and biotechnology*, 10(6), 675-680.
23. Van der Werf, H. M. (1996). Assessing the impact of pesticides on the environment. *Agriculture, Ecosystems & Environment*, 60(2-3), 81-96.