

The impact of chemical fertilizers and pesticides on soil

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Abstract

Soil is one of the Most Important ecological factors. It is the outermost layer of earth crust and reservoir of minerals which are essential for the living organisms. The chemical fertilizer increases the plant growths which ensure food security of the world. Chemically produced plant is very dangerous to the human. Wastes from the industries are disposed into water bodies and added in soil, it degrades the soil health and hence causing the soil pollution. Due to the indiscriminate use of these chemical fertilizers and pesticides will threaten all the life from the earth. Therefore, crop production is depleting our environment and ecosystem. Hence continuous use of chemical fertilizer without taking measure will deplete all the natural resources. Food crops produced using chemical fertilizers may not be as nutritious because chemical fertilizers trade fast growth in plants, resulting in crops less nutritional value. Plants grow on essential nutrients have a cumulative effect on the health of people. Chemical fertilizers may increase the risks of developing cancer. The adverse effect of these synthetic chemicals on human health and environment can only be reduced by adopting new agricultural technological practices such as use of manure, biofertilizers, biopesticides & nano fertilizers etc. which would improve the efficiency of the fertilizers. Organic farming will create a healthy natural environment and ecosystem for the present as well as future generation.

Keywords: Chemical fertilizers, Plant growth, Environment, Agriculture.

Introduction

The impact of chemical fertilizer is now a global concern. Toxic chemical fertilizer and hazardous use of pesticides is the major cause of decline in quality of soil. Rapid economic and industrial growths globally are the main problem of creating environmental problems. In fact, an average consumer is hardly aware of the toxic potential of soil and consequent food contamination. Use of high intensity fertilizers and pesticides for agriculture is affecting millions of people.

Mittal, et. al. (1) pesticides and insecticides are commonly used by the farmers to increase the agricultural yield. Large amount of insecticides and pesticides is being added into the soil to control insect's pests and disease. These chemicals are all absorbed by the plants and some edible parts like fleshy fruits vegetables, grains & oilseed etc. Excessive use of chemical fertilizer resulted in incidents of cancer, kidney failure, asthma, skin problems and digestive tract has increased by 20-25% in Punjab. Mean levels of DDT in breast milk are 17.18 PPM in Ludhiana and 26.66 PPM in Faridkot. Gupta (2) the health hazards are mainly caused by organochlorines, which include DDT, dioxin HCH and Aldrian. Almost every organochlorines study has been linked to some environmental or human health hazards. 40% of all pesticides used in India belong to the organochlorines class of chemicals. Many pesticides like monocrotophos, phorates, phosphomidone, ethane, methylparathion are some of the highly hazardous pesticides & most of them are banned in U.S.A. & Europe but are continually used in India.

Santra (3), it is now accepted that the food grown with natural fertilizers is healthier than that grown with chemical fertilizers. Use of bio pesticides & resorting to organic farming may help to overcome the adverse effect of chemicals fertilizers and other harmful pesticides on human beings. It has been scientifically proved that neem based pesticides are helpful in controlling many pests and are comparatively safer and more effective. The objective of the present investigation is to evaluate the impact of different type of

environmental pollutants and its effect on human health.

Discussion

The use of organic fertilizer is a common practice to maintain soil fertility and crop yield. Due to the increased availability of chemical fertilizers, the utilization of organic fertilizer has dramatically declined. In order to maximize crop yield, and to prevent food shortage large amounts of chemical fertilizers have been used from past few decades. However, Sharma (4) excessive use of chemical fertilizers has led to several issues such as soil degradation, nitrogen leaching, soil compaction, reduction in soil organic matter, and loss of soil carbon. Because of these concerns, there is a growing demand for development of organic agriculture. In this study, we found that N, P and K contents were not significantly different between organic and chemical fertilizer treatments. These results indicated that organic fertilizers provide similar nutrient elements as chemical fertilizer. In recent years, soil acidification has become a serious problem for modern agriculture in India. The major cause of rising soil acidity is increased use of acidifying nitrogen fertilizers or incomplete cycling of nitrogen species in the soil. Our studies have found that organic fertilizer treatment improved soil pH, and increased the contents of amino acids. It is well known that acidification can increase the mobility of heavy metals into the soil where they could be taken up by plants. Kumar (5) some specific microorganism has the ability to adsorb heavy metal. We found that the contents of heavy metals (Cu, Pb, Cd, As) were lower in soil and plant samples under organic fertilizer treatment compared to those treated with chemical fertilizer.

We speculate that long-term application of chemical fertilizers decreased soil pH, promoted the proliferation of some specific microbes and activated the heavy metal ions in soil, further deteriorated the physicochemical properties and quality of tea. However, the long-term application of organic fertilizer was able to alleviate some of this negative effect.

Conclusion

The impact of chemical fertilizers and pesticides was studied. The indiscriminate use of the chemical fertilizers and pesticides in the agriculture causes bad effect on soil. Our food chain has been disturbed and it cause adverse effect on human health so it is our duty to aware people about this hazard for the healthier life.

Chemical fertilizers are produced synthetically by inorganic materials, which providing nutrient and helping plants growth. They contain essential growth nutrients such as nitrogen, phosphorus, and potassium and various others. Chemical fertilizers provide NPK which fulfil the required demands of the plants. Some examples of chemical fertilizers are ammonium sulphate, ammonium phosphate, ammonium nitrate, urea, ammonium chloride etc. But chemical fertilizers also have their hidden dangers, results in damage to the environment and human health. Damage caused by chemical fertilizers is often long-time so alternative and sustainable methods of fertilizing the soil should be adopted.

Use of organic fertilizer treatment will improve the crop quality and decreased the level of heavy metals in soil. Our findings suggest that organic fertilizer can maintain microbial composition and beneficial bacteria into the soil.

Conflicts of interest: The authors stated that no conflicts of interest.

References

1. Mittal S, et al. Effect of Environmental Pesticides on health and rural communities in the Malwa region of Punjab, India: A review, human and ecological risk assessment: An International Journal, 20:2, 366-387, 2014
2. Gupta, Vishwajit., Environment, Geogenic Factor, Human Health and Indoor Pollution. Part - II. P. 558., 2005.
3. Santra SC.: Environmental Science. New Central Book Agency (P). Ltd. London. 1242p, 2005.
4. Sharma D. Ecology and Environment. Rastogi Publisher., 660p, 1997.
5. Kumar Ram, Environmental Chemicals Hazards. 382 pp. 2000.