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Seminar-II

Pesticides and fertilizers pollution in Agriculture

Synopsis

Modern agriculture has included several innovative ideas to enhance the crop production and productivity in the farming sector. Of which, application of chemical fertilizer and pesticides has become the integral part of today's agricultural systems to fulfill the huge demand of food grains of the whole world. However, excessive application of agro-chemicals (fertilizers and plant protection chemicals) is deteriorating the quality of soil as well as groundwater due to the addition of nitrogen, phosphorous, persistent pesticides, *etc.*

Recent data indicates that the application of chemical fertilizers in the country has increased by around 16 per cent from 2015-2016 (510LMT) to 2020-2021 (590MLT) (Anonymous 2021) and also there is an increase in the application of the pesticides by 8.78 per cent from 2015-16 (56,720 Mt) to 2019-2020 (61,702 MT) (https://news.agropages.com). There is a need for balanced use of fertilizers and minimising the usage of pesticide for restoring and improving the environmental situations. In this backdrop, the present study has been conceptualized with the following objectives:

1. To understand the concept of pollution, and pesticides and fertilizers pollution
2. To know the effects of pesticides and fertilizers pollution
3. To review the related research studies

Concept of pollution, and pesticides and fertilizers pollution

Pollution is the introduction of contaminants into the natural environment that causes adverse physical, chemical and biological changes (https://www.nationalgeographic.org).

Pesticide pollution refers to the pollution due to the usage of pesticide on human health and environment. Where as, fertilizer pollution refers to the contamination by excessive inputs of nutrients (https://www.environmentalpollutioncenters.org).

Effects of fertilizers and pesticides

The major effects of fertilizers and pesticides includes: (1) decrease in crop yields**, (2)** soil pollution, (3) destruction of biodiversity, (4) water pollution, and (5) effects on human and animal health.

Reviews related to research studies:

Ragbir Singh Brar (2013) reported that most farmers apply fertilizers on their own without getting their soil tested to compete with other farmers or on the advice of input dealers, who have vested interests. Instead of going by expert recommendation, they increase the dosage of these fertilizers to get more yield and allegedly apply unnecessary supplements on the advice of shopkeepers. The excessive dosage of fertilizers is a threat to soil health and environment, says Charanjeet Singh Pooni, a farmer from Chaina village of Joura district in Madhya Pradesh, who practice natural farming.

Shanta Kumari *et al., (*2014) revealed that in Kullu district of Himanchal Pradesh, most of farmers revealed that they had experienced eye irritation (86.00%) followed by 81.00 per cent, who reportedly experienced fatigue, 66.00 per cent skin irritation, 59.00 per cent head ache and back pain, 56.00 per cent vomiting, 22.00 per cent dizziness and one per cent eye discharge caused by pesticide exposure. In Theog district, 77.50 per cent of the respondents reported eye irritation and back pain, 77.30 per cent fatigue, 77.00 per cent headache, 41.00 per cent vomiting and skin irritation, 31.00 per cent eye flu and nine per cent dizziness.

Chandini *et al.*, (2019) reported that the World agricultural systems is using excessive chemicals, such a fertilizers and pesticides to achieve more production per unit area, but using more doses than optimum or recommended dose of these chemicals and fertilizers leads to several problems like environment pollution (soil, water and air pollution), reduced input efficiency, decreased food quality, resistance development in different weeds, diseases, insects, soil degradation, micronutrient deficiency in soil, toxicity to different beneficial living organism present above and below the soil surface, less income from the production, etc.

Pooja Baweja *et al.*, (2020) reported that chemical fertilizers and pesticides are used to improve the growth of plants and increase the yields of fruits and vegetables in relatively shorter period. The over usage of fertilizers and pesticides is imposing possible risks and adverse effects on the soil health, crop productivity, environment, and human health.

Conclusion

Greater use of modern inputs like chemical fertilizers and plant protection chemicals does not necessarily result in increased soil fertility and crop productivity. The adverse effects of the synthetic chemicals on human health and the environment can be reduced or eliminated by adopting agricultural practices such as use of organic inputs (manure, bio-fertilizers, bio-pesticides, slow-release fertilizers, nano fertilizers etc.) and moving away from chemical intensive cultivation. Therefore, the extension agency should motivate the farmers to adopt the integrated pest and nutrient management practices in agriculture to avoid the ill effects of fertilizers and pesticides on soil and human health.

References

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