

"Excessive use of chemical fertilizers, reduce the fertility power of the soil".

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Abstract: There are many reports that proves, use of chemical fertilizers is a quite useful for the growth and development of plants and crop yield of various crops. But long term use of chemical fertilizers is not beneficial for the soil health and other beneficial microorganisms present into the soil. Due to imbalanced constitution of chemical fertilizers and poisonous pesticides as well as insecticides, they decrease soil fertility in various ways. Some quantity of these chemical fertilizers retained in the plant's body, fruits, grains, and leaves etc. Ultimately, these eaten by human beings and affect human health, causing different diseases also. Thereby, the current research indicating that imbalanced use of these chemical fertilizers/poisonous chemicals, reduce the fertility power of the soil.

Keywords: Biocomposts, Chemical Fertilizers, Fertility Power, Pilibhit District, Agri-waste.

Date of Submission: 12-08-2023

Date of acceptance: 28-08-2023

I. Introduction

It is well known that the farmers of western Uttar Pradesh state of the country are growing different kinds of agricultural crops such as *Brassica campestris* (mustard), *Saccharum officinarum* (sugarcane), *Triticum aestivum* (wheat), *Oryza sativa* (rice), *Mentha piperata* (peppermint), *Cicer arietinum* (chickpea or chana), *Lens esculenta* (lentil or masoor), *Solanum tuberosum* (potato), *Allium cepa* (onion), *Pisum sativum* (pea), etc. in their cropping fields. But in Pilibhit district, the farmers specially growing three kinds of crops i.e. wheat, rice and sugarcane. Thereby, during the time of harvesting of wheat, rice and sugarcane crop, a raw materials or agri-waste in the form of wheat, rice straw and sugarcane leaves, generated in a huge amount. Out of these, sugarcane leave waste management is a typical problem in the district. The farmers of the Pilibhit district traditionally, using different types of chemical fertilizers in the form of Urea, NPK, DAP, including pesticides and insecticides etc. for better crop yield of various crops till now. But, continuous use of these chemical fertilizers/ chemicals, reduce the fertility power of the soil. Although, fertilizer application is an important management measure in agricultural production that not only promote crop growth and yield but negatively influence the soil microorganisms as well (Bargaz et al., 2018). Keeping this in mind, the current study was investigated. This study describe the dependency on chemical fertilizers is the main cause in decrement the fertility power of the soil in Pilibhit district.

The study site

For the present studies, the Pilibhit district was selected for the study. The district has 1440 villages under 721 gram panchayats. Pilibhit district is known for the origin of "Gomati river " and one of the most forest rich area of northern part of India. Pilibhit district also known as "Bansuri- Nagari"- the land of flutes, for making and exporting (about 95% alone from Pilibhit) of flutes on a large scale. In addition, Pilibhit district has own identity on international level for existing " Pilibhit Tiger Reserve". The author surveyed out and investigated dependency of the farmers on the chemical fertilizers thereby time to time, he meet with the farmers at village level and discuss in detail with their problems, their thoughts, their views and the problem of the burning of sugarcane leaves including rice and wheat straw. Hence, these studies, based on the research cum review report, as discussed in the current studies.

Causes of infertility of soil

There are many causes as well as many factors, responsible for the soil infertility in the Pilibhit district. Farmers of the district using Urea chemical fertilizer into their fields in a large amount which increased the nitrogen content into the soil system but other macronutrients leaving constant, thereby soil texture get changed. In addition, for the eradication of insect pests and weeds , farmers using various kinds of chemicals in the form of pesticides, insecticides, weedicides, mixture of calcium oxide and sodium chloride including some other poisonous chemicals like- Sulfas pills, kerosine oil, tobacco leaves etc. into the agricultural soil and also on their

standing crops. According to Prakash (2022), some of the content of these poisonous chemicals retained in the cereals also which are eaten by the human beings and affected their immunity power and different body parts, automatically they easily infected by several diseases like - intestinal, heart, respiratory, nervous and skin diseases *etc.* Some of these chemicals and their products are also responsible for environmental pollution.

II. Discussion

Soil is a very important natural resources of the world. In the present scenario, day by day, due to increasing human populations, the farmers using various kinds of chemical fertilizers, suggested by agri-researchers in the form of market fertilizers, pesticides, insecticides, fungicides, nematicides, and weedicides *etc.* in agricultural lands which is a very serious problem for entire world, because our natural resources *i.e.* soil get poisonous and unfertile. Long term use of chemical fertilizers can dramatically decrease soil pH, which is closely related to reduced bacterial diversity and major changes in the composition of the bacterial population (Wu *et al.*, 2020). Soil microorganisms play an important role in the conservation of soil fertility and ecosystem work (Bisht *et al.*, 2019; Bisht and Chauhan, 2020). A large number of microbes gather around plant roots, which results in a distinction between the state of soil nutrients and the composition of the soil microbial population (Jacoby *et al.*, 2017). There are many reports, who explained the causes of infertility of soil and suggested that the use of biofertilizers should be started in place of chemical fertilizers. Prakash (2022), has reported that continuous use of chemical fertilizers for a long time period, reduce the fertility power of the soil. He further concluded that use of chemical fertilizers should be stopped and use of biofertilizers should be accepted and started in the form of vermicompost and FYM (Farm Yard Manure) into the cropping fields for better crop yield of various crops. According to Sunitha (2000), application of recommended dose of fertilizers and vermicompost was significantly superior in increasing growth performance and lower pest incidence in chilli nursery. But due to imbalanced concentrations of macro and micronutrients of these fertilizers, changed the texture of soil in various ways. Vermicompost serves as a nutrient rich natural fertilizer improves the physical, chemical and biological properties of soil (Ansari and Jaikishun, 2011; Nath *et al.*, 2009; Kale, 1998) and reduces the use of chemical fertilizers (Chanda *et al.*, 2011; Hernandez *et al.*, 2010). In addition, Prakash (2022), concluded that vermicompost prepared by the agency of earthworms through vermicomposting process, showed better growth and crop yield of *Brassica* than the other Chemical fertilizers, applied into the cropping fields. Although, FYM biofertilizer was also effective than chemical fertilizers. Sometimes, presence of larger trees in and around the agricultural fields are responsible for the infertility status of the soil. Because they are not only absorbing the micro and macronutrients of the soil but most of the water content is also absorbed, simultaneously and the crop yield thus, greatly affected. Thereby, Prakash (2020), concluded and suggested that for the better production of crop yield, cropping field's boundaries should always be free from larger and perennial trees, because most of the contents of the organic manure and fertilizers applied into the fields, absorbed by such plants during several years. Agricultural wastes constitute a long list of crop residues, including farm wastes, rotten vegetables and fruits, aquatic weeds, social forestry wastes like fuel wood, bark, fallen leaves, pine needles, several types of agro-industrial wastes from sugarcane mills, rice mills, pulse mills, and saw mills, animal dung and urine and slaughter house, animal wastes, agricultural wastes are thus biomass that includes all complex organic compounds (Dhaliwal and Kansal, 1994). However, few studies have been concluded on the utilization of agricultural waste for composting and animal fodder (Veeresh *et al.*, 2011). The practice is usually to burn these residues or to leave them to decompose. However, studies have shown that these residues could be processed into liquid fuels or combusted or gasified to produce electricity and heat (Barnard and Kristoferson, 1983; Soltes, 1983; Enweremadu *et al.*, 2004).

Agricultural waste from livestock farms and pesticides and fertilizers constitute the highest source of organic pollutants polluting our rivers and costal waters, second only to sewage (Rahimah, 2007). Burning of sugarcane leaves is a very bad and traditional habit of the farmers, in the district. Due to lack of awareness, the farmers are unable to proceed this agri-waste into other useful products like vermicompost and biomanures. Although, burning of sugarcane leaves in the cropping fields is now banned in the Pilibhit district, since the last few years. This is an important effort made by Uttar Pradesh government. Because burning of agri-wastes responsible for the death of useful microorganisms, present into the agricultural field soil. This is the another cause of soil infertility. Thereby, presently, researchers are trying for transformation of sugarcane leaves as well as other agri-wastes into the useful biomanure.

III. Conclusion

Thus, the farmers of Pilibhit district depends on the chemical fertilizers, pesticides, insecticides, weedicides and grow a particular crop again and again in the similar agricultural fields on the one hand and burn agri-waste (sugarcane leaves, rice straw and wheat straw *etc.*) after harvesting of the crops into their cropping fields on the other hand. These two factors are mainly responsible for soil infertility. In addition, lack of the use of biofertilizers or biocomposts or biomanures is the another cause for soil infertility and therefore, the present

study, concluded that the use of chemical fertilizers and burning of agri-wastes into the agricultural fields should be now stopped and use of the natural fertilizers i.e. Farm-yard manure (FYM), vermicompost, green manure, biopesticides, bioinsecticides and other biofertilizers should be started into the agricultural fields, otherwise, our coming generations will face various problems concerning with the agricultural practices for better crop yield, their survivability, and several other environmental issues also.

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Dr. Om Prakash earned his master's degree and Ph.D. in the subject of Animal Science (Applied Zoology) from Mahatma Jyotiba Phule Rohilkhand University, Campus (Bareilly). Dr. Prakash has made extensive study on the 'Density and Diversity of Earthworms of western Uttar Pradesh, India' with emphasis on Solid Waste Management. Dr. Prakash is a Life member of Indian Water Resources Society (IWRS), Roorkee, India and The Indian Society for Soil Biology & Ecology (ISSBE). He has awarded time to time by different Academies/Foundations/Agencies such as "Braj Darpan Samman-2023" awarded by Brajlok Sahitya Kala Sanskrit Academy, Fatehabad (Agra, Regd. under Govt. of UP), "National Pride Award-2023" awarded by Socially Point Foundation (Regd. under Govt. of MP) and "Dr. Bhimrao Ambedkar Rastriya Gaurav Samman" awarded by Vishwa Ganga Vahini & Sodh Sansthan-Agra (Regd). Presently, he is working as Assistant Professor of Zoology, at Constituent Government College, Bhadpura, Nawabganj, Bareilly (U.P.). He has contributed 21 research papers (08 International and 13 National) in various journals of National and International (America, Switzerland, Mexico & Germany), repute till now.