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The Hidden Dangers of Chemical Fertilizers

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ABSTRACT

Chemical fertilizers are important for the cost-effective production of commercial crops, and have been since the 1930s. With a growing population and high cost of living, a bountiful harvest ensures enough food is available for everyone at affordable prices. However, using chemical fertilizers do have their hidden dangers about which most people may not know. Though the chemical fertilizer increases the plant growth and vigour, hence meets the food security of the world, but the plants grown in this way does not develop good plant characters such as, good root system, shoot system, nutritional characters and also will not get time to grow and mature properly. Chemically produced plant will accumulate in the human body, toxic chemicals, which are very dangerous. The deleterious effect of the chemical fertilizers will itself start from the manufacturing of these chemicals. The adverse effect of these synthetic chemicals on human health and environment can only be reduced or eliminated by adopting new agricultural technological practices such as shifting from chemical intensive agriculture which includes the use of organic inputs such as manure, biofertilizers, biopesticides, slow release fertilizer and nanofertilizers etc. which would improve the application efficiency as well as use efficiency of the fertilizers. Opting organic farming will create a healthy natural environment and ecosystem for the present as well as future generation.

Keywords: Chemical fertilizers, environment and ecosystem, plant growth, Hidden Dangers

INTRODUCTION

The industrial revolution followed by the green revolution which fulfilled the food demands of the growing population caused an increase in yield per unit area in crop production, but they also increased the use of synthetic fertilizers in agriculture. Less soil fertility is one of the most vital constraints in improving the agricultural production . But the intensive use of inorganic fertilizer in agriculture worldwide for ensuring the world food security caused so many health problems and unrecoverable environmental pollution. griculture plays a vital role in the Indian economy. With 70 per cent of the rural households about 18% to the total GDP and employment to over 60% of the

population as a largest provider of livelihood, horticulture, emerged as interactive passion of Indian agriculture which contributes 30.7 percent of agricultural GDP with only 8 percent of area allocated to horticulture included fruits, spices, plantation and vegetables etc.

METHODOLOGY

We employed a mixed-methods approach in this study to combines elements of quantitative research and qualitative research.we pay attention to the variables such as impact of chemical fertilizers on vegetables production, Deleterious Effects of Chemical Fertilizers and widespread impact on human health.

MODELING AND ANALYSIS

Why Use Fertilizers?

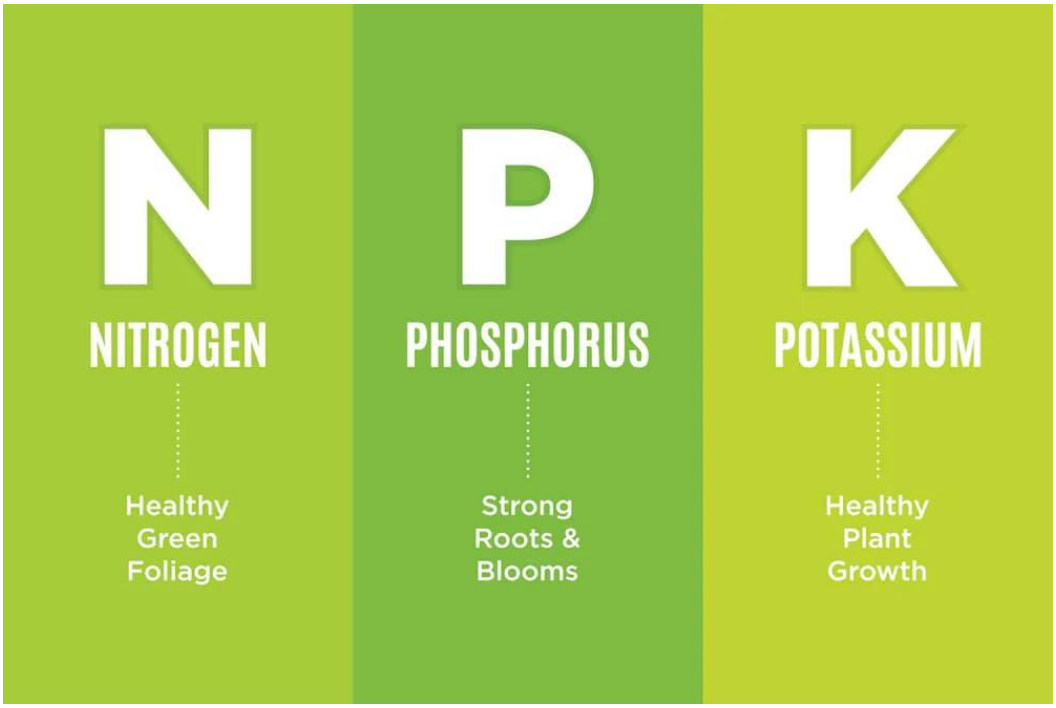
The purpose of any fertilizer is to increase the amount of nutrients in soil that make it more fertile and friendly to plant growth. Typically present in fertilizers are one or more of the macronutrients nitrogen, phosphorus, and potassium, or NPK. Any one of these is pretty much all a plant needs to grow, and grow fast. Other nutrients may also be present, depending on the source.

There are two main types of fertilizers, organic and chemical. As the name suggests, organic fertilizers come from organic sources such animal manure and plants. They tend to be hit-and-miss unless processed carefully, in which case they tend to be expensive. Chemical fertilizers come from inorganic materials, which undergo chemical treatments. The formulations are precise and deliberate, depending on its intended use, and they are relatively cost-effective.

At face value, you might think that chemical fertilizers give farmers more control over their crop production at the right price. You would be right, but you would also be wrong. Chemical fertilizers do allow farmers to produce more and/or high-quality crops in the short-term, but may lead to fewer or poor quality crops in the long term. This is because of the intricacies of soil health.

Much like humans, the soil needs a delicate balance of nutrients to remain healthy. While NPK can definitely help plants and crops grow, simply adding them to the soil without regard for keeping the balance can lead to unintended consequences or hidden dangers.

Role of NPK in Plant Growth



The three most important nutrients, without any one of which plants could not survive, are referred to as the primary macronutrients: Nitrogen (N), Phosphorus (P), and Potassium (K).

1. Nitrogen is a key component in many of the processes needed to carry out growth. In particular, nitrogen is vital to chlorophyll, which allows plants to carry out photosynthesis (the process by which they take in sunlight to produce sugars from carbon dioxide and water).
2. Phosphorus also plays a role in an array of functions necessary for healthy plant growth, contributing to structural strength, crop quality, seed production, and more. Phosphorus also encourages the growth of roots, promotes blooming, and is essential in DNA.
3. Potassium is also vital in a variety of other processes that contribute to growth and development. Potassium is often referred to as the "quality element," because of its contribution to many of the characteristics we associate with quality, such as size, shape, colour, and even taste, among others

Environmental Issues

One of the problems with chemical fertilizers is they seep through the soil into the groundwater and other water sources, leading to contamination. Now, NPK in small quantities is non-toxic, but a lot can kill the balance of nature in various ways. Nitrogen is especially tricky.

One way is by doing exactly what it is supposed to do, which is help plants grow. The problem is it creates what experts call a dead zone. When it is in the water, it encourages the growth of plankton and other aquatic plants to excessive amounts. When they die, the process of decomposition eats up oxygen that fish and other aquatic animals need to survive. As a result, the waters closest to the land where agricultural runoff is also heaviest are empty of fish and crustaceans. This upsets the ecosystem of the area and the local fishing industry.

The environmental issues of using chemical fertilizers are bad, and they will take many years to address. However, an immediate concern with chemical fertilizers is the effect on human health.

Human Issues

At the very least, food crops produced using chemical fertilizers may not be as nutritious as they should be. This is because chemical fertilizers trade fast growth for health in plants, resulting in crops that have less nutritional value. Plants will grow on little more than NPK, but they will be missing or developing less of essential nutrients such as calcium, zinc, and iron. This can have a small but cumulative effect on the health of people that consume them.

At worst, chemical fertilizers may increase the risks of developing cancer in adults and children and adversely affecting fetal brain development. This is not news to scientists. A 1994 study by the University of Wisconsin suggest show that typical concentrations of nitrate (a common fertilizer) and a pesticide in the groundwater may compromise the nervous, endocrine, and immune system of young children and developing fetuses. A study in 1973 associates high levels of sodium nitrate in groundwater with the prevalence of gastric cancer, and another one in 1996 with that of testicular cancer.

A relatively recent study, however, shows that chemical fertilizers may play a significant role in the development of methemoglobinemia, otherwise known as Blue Baby syndrome. Researchers believe the condition results from feeding the infants with baby formula using well water contaminated with nitrates. The baby literally turns blue and may eventually lead to coma or death.

Chemical fertilizer contamination is not just a danger in rural areas, either. Much of the excess fertilizer originates from cities, applied over residential and commercial lawns and making their way to the water

supply. The problem is such that many cities have laws restricting the use of chemical fertilizers in public spaces.

Impact of Chemical Fertilizers on Natural Resources

The World agricultural systems is using a large number of chemicals such a fertilizers, pesticides, herbicides to achieve more production per unit area but using more doses than optimum or recommended of these chemicals and fertilizers leads to several problems like environment pollution (soil, water, 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. Despite these many problems, there is also a challenge to meet the food demands of the world's growing population. Therefore, there is a need to produce nutrition rich and chemicals free agricultural produce for the human and animal consumption without deteriorating are natural resources that is why emphasis should be laid on the production of food rich in quality as well as quantity.

Effect of Chemical Fertilizers on Environmental Pollution

Pollution is contamination of air, water or soil by substance that are harmful to living organisms. In simple manner any direct or indirect alternation in any property, any component from the environment, which disturbs the original functioning of the same.

Effect of Chemical Fertilizers on Water Pollution

Water is the most essential component for human existence. The earth is called as „Blue Planet" because of water which covers almost three fourth of earth"s surface. Water is not only essential for survival of all living things but is also the source of economic wealth and the creator of beautiful environment. Chemical fertilizers contain phosphates, nitrates that can actually be the main reason
behind water pollution. Nitrate leaching particularly linked Effect of Chemical Fertilizers on Human Health Fertilizers are a mixture of toxic chemicals which are absorbed into the plants, leading toxins to enter the food chain via vegetables and cereals and water creating
health affects increase and spread rapidly-contaminated water may contain high level of nitrates and nitrites, causing hemoglobin disorders. Heavy metals such as Mercury, Lead, Cadmium and Uranium have been found in fertilizers, which can cause disturbances in the kidneys, lungs and liver and cause cancer.
Over 29 popular fertilizers tested positive for 22 toxic heavy metals, including silver, nickel, selenium, thallium and vanadium, all directly linked to human health hazards. Ammonium Nitrate exposure causes other health problems such as eye and skin irritation, producing a burning sensation. Inhalation exposure can result in irritation of the nose, throat, and lungs. One can also experience nausea, vomiting, flushing of the face and neck, headache, nervousness, uncontrolled muscle movements, faintness and collapse. Potassium Chloride interferes with nerve impulses, and interrupts with virtually all bodily functions and mainly affects heart functioning. It can cause all kinds of gastric and stomach pains, dizziness, bloody diarrhea, convulsions, headaches, mental impairments, redness or itching of the skin of eyes.

CONCLUSION

Today, use of fertilizers is seen as a necessary agricultural crop production, because soil restores nutrients. However, firstly soil analysis should be performed carefully. After then, fertilizer should be given to soil.

The structure and chemical content of the soil should be identified and the most appropriate type of fertilizers should be selected. The most suitable method should be processed. Otherwise, the fertilizer should be noted that errors will result in the loss of both energy and inance. Fertilizing should be done in time, should not be inappropriate times. For example a heavy rainfall to the seasons, fertilization, and fertilizers water will mix with the surrounding soil by leaching. For this reason, fertilizer will be lost from soil, as well as pollution of surrounding water and therefore it will result in harmful. Use of excessive quantity of synthetic fertilizers is harmful for human health. High levels of nitrates and nitrites in chemical fertilizer may cause some diseases.

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