

Vermicompost, inorganic fertiliser, and biofertilizers all have different effects on the biochemical components of chillies (Ns - 1701)

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Abstract

In addition to the creation of premium fertilisers without the use of agrochemicals, organic agriculture is a holistic approach to farming. Biofertilizers, or live organisms used to fertilise soil, are a valuable addition to the common use of chemical nitrogen fertilisers and contribute to the soil's enrichment. Vermicompost is a coarse, humus-like, blackish-brown substance with electrically charged particles designed to promote soil nutrient uptake by plants. Vermicompost's organic carbon slows the release of nutrients into the system so that they can be absorbed by the plant. The goal of the current study is to determine how applying biofertilizers, inorganic fertiliser, and vermicompost separately or in combination will affect the biochemical components of chillies (NS- 1701).

Introduction

The goal of sustainable agriculture is to maintain agricultural output and natural resources over the long term with little harm to the environment. It places a focus on maximising crop production with the least amount of external inputs possible, lowering reliance on external commercial inputs (such as fertilisers and pesticides), and replacing them with internal resources [1]. To maintain soil fertility and improve crop output, an effective nutrient management system utilising organic manures, inorganic fertilisers, and biofertilizers is now needed [2]. The high concentration of micronutrients and macronutrients in organic manures, together with phosphorus' delayed release, may lessen nutrient deficiency issues and the severity of phosphorus

fixation.

It is now necessary to come up with alternative methods for gathering, processing, composting, and using organic manure. Biofertilizers such blue-green algae, phosphate-solubilizing bacteria, azotobacter, azospirillum, acetobacter, rhizobium, and azolla are also needed [3]. Early in the 1970s, chemical fertilisers such as N, P, and K had a substantial impact on plant productivity and quality. However, recent research has shown that using chemical fertilisers indiscriminately and in an uneven way can cause a number of issues, including soil health, nutrient deficiencies, loss of microbial activity, and fertility loss, all of which impair crop productivity and quality [4].

In this regard, nitrogen, phosphorus, and potash are of utmost importance. Nitrogen promotes vegetative growth, phosphorus aids in early crop establishment, the development of fibrous and strong roots, aids in nutrient absorption from the soil, and ultimately aids in seedling growth that is quick. The production of carbohydrates is aided by potash. Additionally, it aids in the management of moisture within plant systems, minimising the negative consequences of moisture stress during periods of water scarcity [5].

Vermicomposting is a method for turning organic waste into excellent organic manure or for the decomposition of organic waste by earthworm ingestion. It involves using epigeic earthworm species. Vermicomposting is a method of managing solid waste that views organic solid wastes as resources [6]. The most extensively used method for recycling agricultural and other biowastes into the soil to refill it with scavenged nutrients, notably organic matter and micronutrients, is composting. While trace elements like Zn, Cu, Cr, Mn, and Fe are necessary for plants, they can also be harmful to the health of humans, animals, and other living things. The concentration of trace elements in compost should therefore not be higher than allowed [7].

One of the most lucrative commercial spice crops is the chilli (*Capsicum annum*), which is produced on 0.95 million hectares of land in India [8]. Ascorbic acid is abundant in chillies. Capsaicin and capsorubin are responsible for the fruit's colour [9]. The only source of capsaicin is a chilli, which has a substantial physiological impact and is a key ingredient in many pharmacological and cosmetic products [10].

In order to determine the impact of both individual and

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combination application of biofertilizers, vermicompost, and inorganic fertilisers on the biochemical components of chilli, a study was conducted (NS -1701).

Conclusion

The most essential nutrients for plant growth are NPK; a suitable combination of biofertilizer, chemical fertilizer, FYM, organic manure, and vermicompost would promote greater nutrient uptake by the crop and also improve the health and fertility status of the soil. It is advised that using organic manures would increase the yield of chillies, and that the product would then be processed and used in pharmaceutical preparations.

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