



Studies on effect of soil nutrient enriching microbes on the growth of tomato

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Abstract

A field experiment was conducted at farm of College of Agricultural Biotechnology, Sangulwadi during *rabbi* season of 2017-2018 with view to study the Plant height¹, leaves plants¹, branches plant¹, days to flowering, yield plant¹ as influenced by tomato. The experiment was laid out in Randomized Block Design planted in five replications. The results revealed that, the treatment T₂ (Soil + biofertilizer) recorded maximum number of height plant¹ (88.00cm), leaves plant¹ (76.12), branches plant¹ (13.40), days required for flowering (31.00 days) and yield of fruits plant¹ (7.81 kg). Whereas, in the treatment T₂ (Soil + biofertilizer) the nutrient composition of soil was increased in N, P, K content after biofertilizer treatment than the control treatment *i.e.* soil.

Keywords: tomato, biofertilizer, growth, flowering, yield, nutrients

Introduction

Tomato (*solanum lycopersicum* L.) belongs to family solanaceae. It is a self-pollinated crop and Peru-Ecuador region is considered to the centre of origin. Tomato was introduced by the Portuguese. Tomato is cultivated in tropics and subtropics of the world and it is being cultivated in kitchen gardens, commercial fields under green house and polyhouse conditions and soil less culture or hydroponic systems. Tomato is one of the popular vegetables of great commercial value and is used in various forms of salad, soup, kitchen, sauce, chutney, pickles, powder, paste, juice, puree and whole canned fruits (Arya, 2004) ^[4]

The present farming totally depends on use of chemical fertilizers, pesticides and growth regulators for enriching crop productivity. Gradually culminated in a situation where in needed to reconsider the alternative to chemical agriculture as gradually developed in the western world. It is a well-documented fact that increased dependence on agro-chemicals including fertilizers has led to several ill effects on the environment. Organic farming is a production system which avoids or largely excludes the use of synthetically produced fertilizers, pesticides, growth regulators and livestock feed additives (Narayan *et al.* 2008).

In konkan region people are intended on natural and organic sources for taking production of crops to complete their daily dietary needs. In that case organic farming is going to help them alot. Organic farming: "Organic farming is method of crop and livestock production that involves much more than choosing not to use pesticide, fertilizers genetically modified organisms, antibiotics and growth hormones". Organic production is holistic system designed to optimize the productivity and fitness of drives communities within the agro-eco systems, including soil organisms, plants, livestock and people. The principle goal of organic production is to develop enterprises that are sustainable and harmonious with the environment.

In organic farming nutrient management is going to play a key role in production, organic manures, bulky organic manures with biofertilizers can be used for fulfilling the nutrient of crops.

Biofertilizers along with organic manure Soil nutrient microbes increases the nutrient content of soil. The soil nutrient enriching microbes helps to convert the nutrients to the farm that is readily absorbed by the plants. As well as they are going to help for increasing the count of beneficial microbes in soil.

Tomato (*B.N-Solanum lycopersicum*) is solanaceous crop with require higher quantities of nutrient for its growth. It is also more sensitive to nutrient deficiencies so this vegetable crop is selected to carry out research entitled studies on effect on soil nutrient enriching microbes on growth of tomato.

Generally, solanaceous vegetables require large quantity of major nutrients like nitrogen, phosphorus and potassium, in addition to secondary nutrients such as calcium and sulphur for better growth, quality and yield. The cost of in organic fertilizers has been enormously increasing to an extent that they are out of reach of the small and marginal farmers. It has become impractical to apply such costly inputs for a crop of marginal returns. The use of biofertilizes in such situation is, therefore, a practically paying proposal. Phosphorous-solubilizers are biofertilizers which, *Azospirillum* heterotropic nitrogen fixing organism have been reported to be beneficial and economical on several crops. They are known to improve growth, yield as well as productivity of crops (Okon,1985). Therefore, the use of chemical fertilizers cannot be avoided but its consumption can be lowered down by using alternate sources of fertilization *i.e.* organic manure and biofertilizers. So, the field experiment was conducted during Rabi season of 2018 at Agril-Biotechnology, sangulwadi. Entitled "Studies on effect of soil nutrient enriching microbes on the growth of Tomato" with following objective;

Materials and Methods

The field experiment was conducted during Rabbi Season of 2018 at College of Agricultural Biotechnology, Sangulwadi. Entitled 'Studies on effect of soil nutrient enriching microbes on the growth of Tomato.'

Sample collection

The seedlings of Tomato (*Solanum lycopersicum* L.) variety Abhinav was collected from Nursery of college of Horticulture, Sangulwadi (MS).

Methods

This embodies concise dissertation of the method adopted and materials used during the course of investigation. The experiment "Studies on effect of soil nutrient enriching microbes on the growth of tomato" (*Solanum lycopersicum* L) was conducted at College of Agricultural Biotechnology, Sangulwadi, (MS), during the rabbi season of 2017-18.

Experimental site and Climate

The experiment was carried out in research farm, of College of Agricultural Biotechnology, Sangulwadi (MS) during 2017-18. Vaibhavwadi taluka is a taluka in Kankavali subdivision of Sindhudurg district in the Indian state of Maharashtra. Climatic conditions in the district are strongly by its geographical conditions. The district falls under the 'Assured and high Rainfall zone'. The climate is generally humid. Vaibhavwadi has a semi-tropical climate and remains warm and humid in most of the year. It has three clear seasons: rainy (June-October), winter (November-mid February) and summer (mid-February-May)

Result and Discussion

Table 2

Treatments	Height plant ⁻¹	Leaves plant ⁻¹	Branches plant ⁻¹	Days Required for Flowering	Yield plant ⁻¹
T ₁ - control	83.80	72.88	11.40	39.20	2.35
T ₂ - Soil + biofertilizer	88.00	76.12	13.40	31.00	7.81
T ₃ - Soil + vermicompost	83.50	73.30	11.60	35.60	4.40
T ₄ - Soil + Biofertilizer + Vermicompost	84.10	75.20	13.40	34.20	6.26
'F' test	Sig.	Sig.	Sig.	Sig.	Sig.
SE (m) ±	0.66	0.55	0.43	0.76	0.23
CD at 5%	1.97	1.32	1.28	2.27	0.67

At the stage of 75 days after transplanting, the significantly maximum height plant⁻¹ was recorded in T₂ (88.00 cm) whereas minimum plant height⁻¹ was recorded in T₁ (83.50 cm).

At 75 days after transplanting, significantly maximum number of leaves plant⁻¹ was recorded in T₂ (76.12). Whereas, significantly minimum number of leaves plant⁻¹ was recorded in T₁ (72.88).

At 75 days after transplanting, significantly maximum number of branches plant⁻¹ was recorded in T₂ (13.40) and T₄ (13.40). Whereas, significantly minimum number of branches plant⁻¹ was recorded in T₁ (11.40)

At 45 days after transplanting, significantly minimum days required for the flowering was recorded in T₂ (31.00) whereas, significantly maximum days required for the flowering was recorded in T₁ (39.20).

Monsoon winds bring heavy rains, with an average rainfall of 3240.10 mm. The average annual rainfall for the period 2002-2011 ranges from 2752.19 mm (Devgad) to 3980.19 mm (Vaibhavwadi).

The major crops are rice, mango, cashew, coconut, vari, nachani, groundnut, jackfruit beetle nut and spices.

Soil

The predominant soils in the Vaibhavwadi are of lateritic type. They show variation in colour and range from bright red to brownish red due to the preponderance of hydrated Iron oxides. Their strategies by taking into account the basic tenets like: study of the overall development scenario present as well as potential taking into consideration all sectors of regional economy, their by leading to a healthier quality of environment and better quality of life for the people.

Chemical composition of soil

The Estimation of chemical composition of soil was carried out for to study combined effect of soil nutrient enriching microbes and organic manures on nutrient content of soil and to study effect of soil nutrient enriching microbes on nutrient content of normal soil are given below,

Table 1

Particulars	Value (Kg/ha)
N	143.49
P	4.74
K	1087.86

At 75 days after transplanting, significantly maximum days yield plant⁻¹ was recorded in T₂ (7.81 kg). Whereas, significantly minimum yield plant⁻¹ was recorded in T₁ (11.40 kg).

Table 3: Nutrient composition of Soil as influenced by period

Particular	Value Before Planting (Kg / ha)	Value After Harvesting (Kg / ha)
N	143.49	238.68
P	4.74	29.93
K	1087.86	1140.24

From the above table the nutrient composition of the soil shows increases in N, P, K content after biofertilizer treatment than the control soil

Referance

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