



# Effect of Different Concentrations of Vermiwash and Chemical Fertilizers on Growth, Yield and Quality of Chilli (*Capsicum annuum* L.) Var. Pusa-jwala

Changdev Chavan<sup>1</sup>, Raturaj Shete<sup>2</sup>, Vijaya Nikam<sup>3</sup>, Dilip Kurlapkar<sup>4</sup>,

Dattatray Gaikwad<sup>5</sup>.

<sup>1</sup> Sahakar Maharshi Shakarao Mohite-Patil Mahavidyalaya, Natepute.

<sup>2</sup> Shri Sant Damaji Mahavidyalaya, Mangalwedha.

<sup>3</sup> S.G.M College, Karad.

<sup>4</sup> Kai. S.B. Khade Mahavidyalaya, Koparde.

<sup>5</sup> Shivaji University Kolhapur.

Email - [changdevd8085@gmail.com](mailto:changdevd8085@gmail.com)

## Abstract

Chilli (*Capsicum annuum* L.) is cultivated fruit vegetable belonging to family Solanaceae, which can grow all over the world. In India, chilli plant contributes 9% of total vegetable production. Chilli is a rich source of spicy-hot capsaicin. In the present study we observed the effect of vermiwash and chemical fertilizers on growth and yield of Chilli (*Capsicum annuum* L.) cv. Var. Pusa-jwala. All the parameters like growth, yield and quality of chilli exhibits good result due to vermiwash as compared to chemical fertilizers.

**Keywords** Chilli (*Capsicum annuum* L.) Vermiwash.

## Introduction

Chilli (*Capsicum annuum* L.) is an easily cultivated fruit vegetable belonging to family Solanaceae, which can grow all over the world round the year in India, Chilli plant contributes 9% of total vegetable production. Brinjal is a rich source of carbohydrates, proteins, fibres, vitamins and minerals. It is easily available in market and has been a common vegetable in diet. Different parts of Chilli plant and fruits are used as medicines in various countries for healing kidney stones, liver disorders and diabetes.

Chilli (*Capsicum annuum* L.) grows to a height of 60-120 cm. The plant is erect, compact, well branched having fibrous root system. Leaves are simple, large, lobed and alternate. The flowers sprout singly or in small clusters from the leaf axis. The single flowers are an off-white (sometimes purplish) colour while the stem is densely branched and up to 60 cm (24 inch) tall. The fruits are peppers that may be green, yellow, orange or red when ripe. While the species can tolerate most frost-free climates, *C. annuum* is especially productive in warm and dry climates.

Earthworms play a vital role in Plant growth and productivity in recent times the commercial vermin culturists have started promoting a product called vermiwash. Vermiwash is a brown colour liquid fertilizer collected after water passes through warm culture from vermicomposting (Kobatke1954). This vermiwash would have enzyme secretions of earthworms which would stimulate the growth and yield of agriculture crops and even develop resistance capacity in crop (Shiv subramanian and Ganesh kumar 2004). Vermiwash play an important role in the plant growth and development and improvement in crop production increasing soil organic matter and increase in nutrient content which is radially available in plant, resulting in good crop yield (Satchell, J.M. and Martein, K.1984). In vermiwash rich source of vitamins, hormones (auxins, cytokinin) macronutrient (N, P, K, Ca, Mg) and micronutrients (Mn, Zn, Fe, Cu) when applied to plant help in efficient growth (Said A.H. 1997). The objective of our research is to see the effect of Chemical fertilizer and vermiwater compost on growth and yield of Chilli (*Capsicum annuum* L.)

## Material and Method

The seedlings of Chilli (*Capsicum annuum* L.) Pusa-jwala chilli seed variety were collected from local market shop. Vermiwash was collected from Zoology department. Chemical fertilizer collected from vedant agro agency in Natepute. The experiments were conducted in the Department of Botany, Sahakar Maharshri Shankarao Mohite-Patil Mahavidyalaya, Natepute Tal. - Malshiras Dist. Solapur (MH). during 2020-21 using field experiment. Weight 4 kg soil and add in pot about 15 seeds were sown in each pot and allowed to germinate and watered as per need. All necessary intercultural operations were performed as and when required. Five plants were selected randomly and tagged in each pot for recording various morphological observations at 30, 60, and 90 days after sowing. Plants were analysed at 60th days for various growth parameters, biochemical constituents and enzyme activities. The experiments were conducted in five replicates. The various growth parameters of Plant height, Number of branches per plant, Number of fruits per plant and Fruit length were measured at 30, 60, and 90 days using standard laboratory methods. The freshly harvested leaf from top of different plants from treatment and control was collected, cleaned properly blotted dry, cut into small pieces and the composite leaf sample was prepared. The composite sample of leaf was used for different physiological analysis. Biochemical constituents like total Chlorophyll Estimation and Estimation of ascorbic acid. The total Chlorophyll Estimation by using arnon method. The estimation of ascorbic acid by colorimetric method.

## Results and Discussion

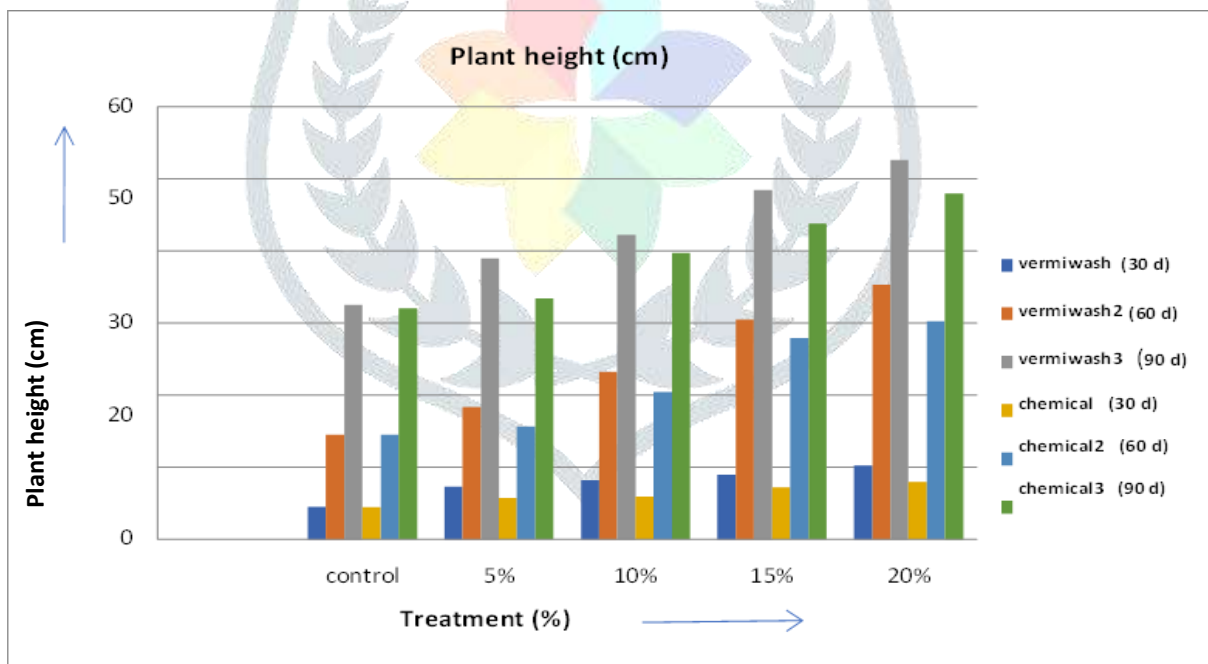
The effect of Vermiwash compost and chemical. On seedling growth Chilli (*Capsicum annuum* L.) was studied at 30, 60, and 90<sup>th</sup> days. The growth parameters like plant height, Number of branches per plant, Number of fruits per plant and Fruit length showed increase in Vermiwash compost as compared to control and chemical. The same pattern is observed in case of biochemical constituents in Chilli.



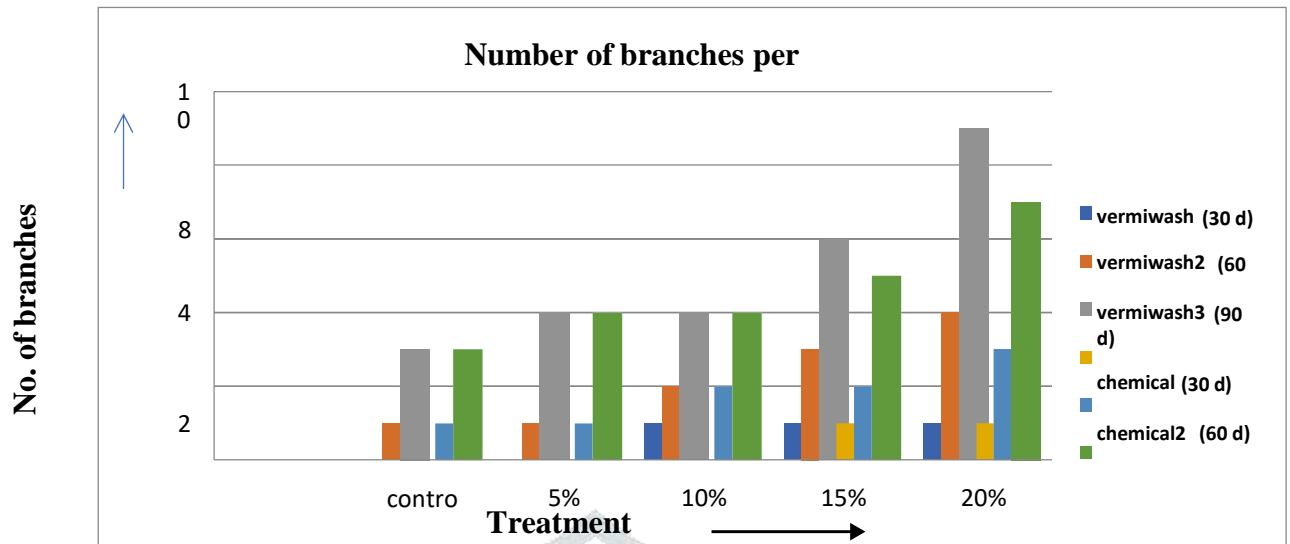
Fig. Effect of different concentration of vermiwash on chilli plant.



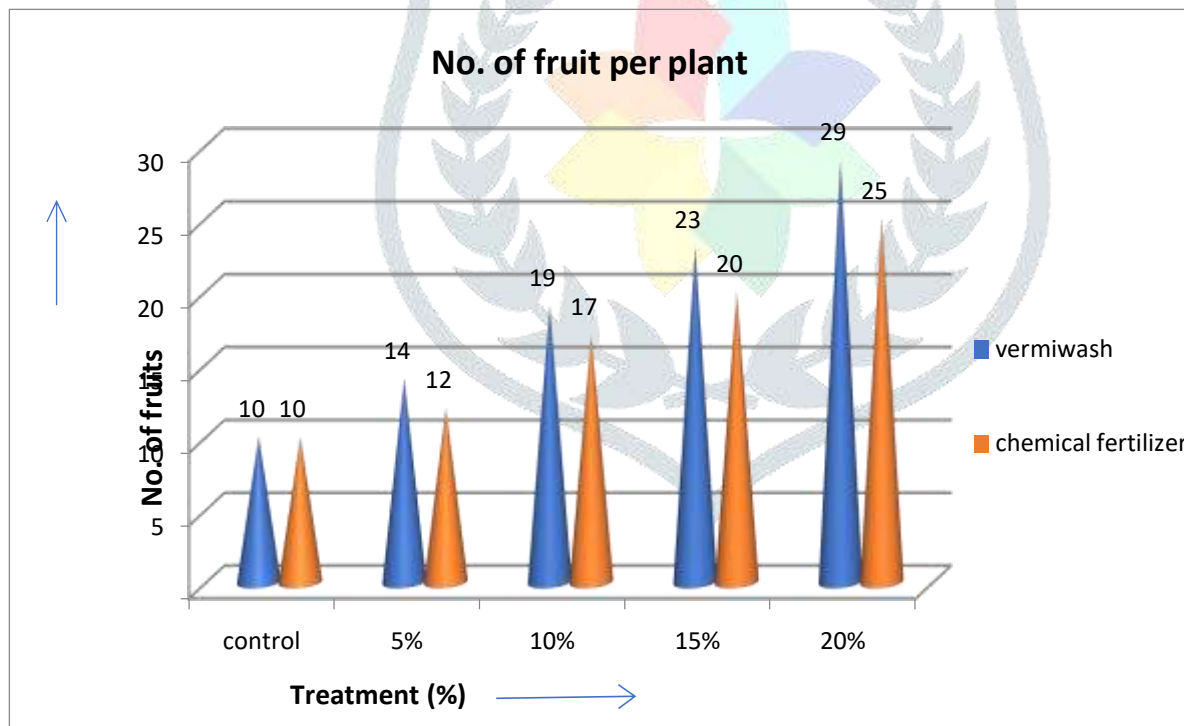
Fig: Effect of different concentration of chemical fertilizers on chilli plant.



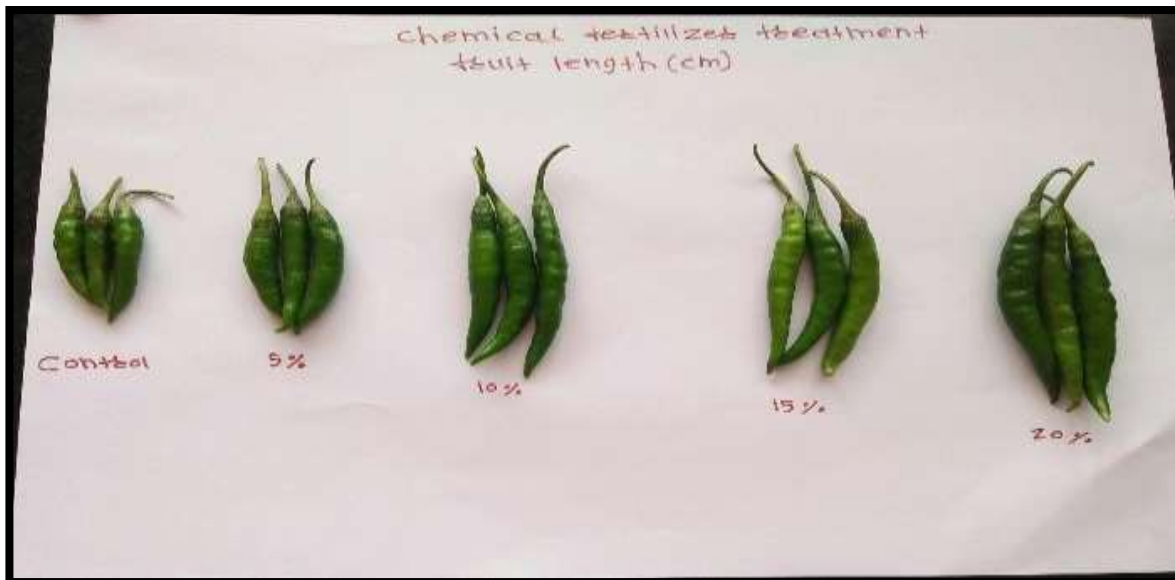
Effect of different concentration of vermiwash and chemicals fertilizer on plant height (cm) of chilli.



Effect of different concentration of vermiwash and chemical fertilizer on number of branches plant of chilli.



Effect of different concentration of vermiwash and chemical fertilizer on number of fruits per plant of chilli.

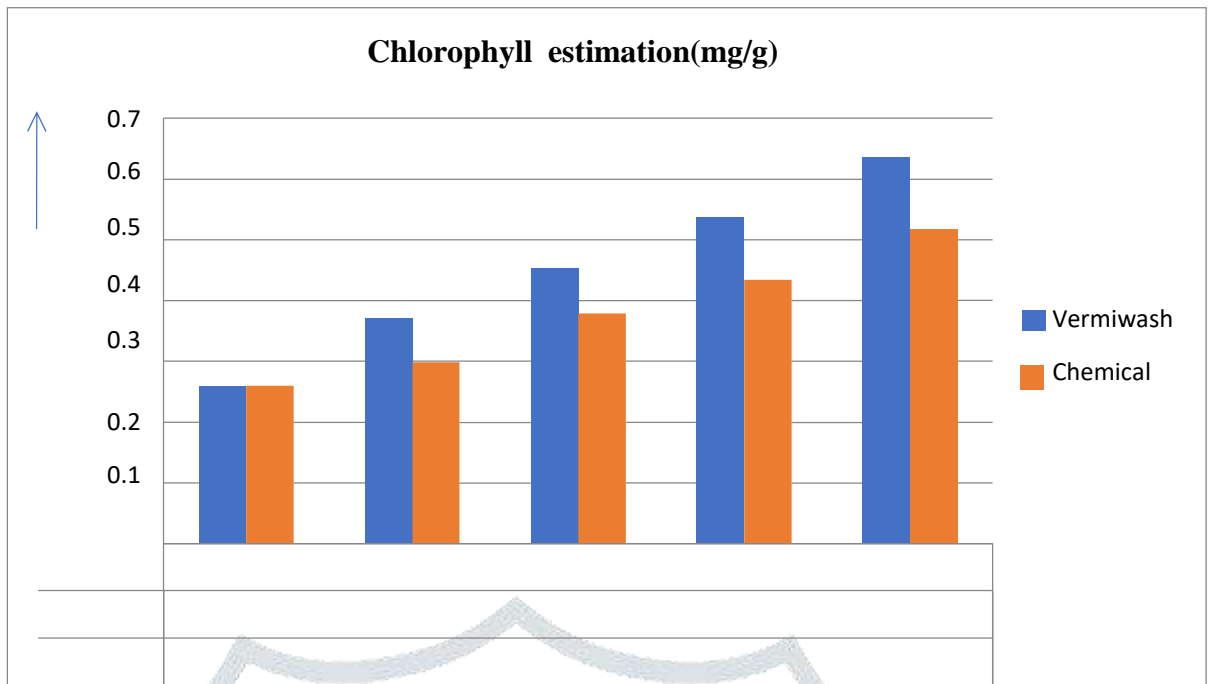


Effect of different concentration of vermiwash on fruit length of chilli plant.



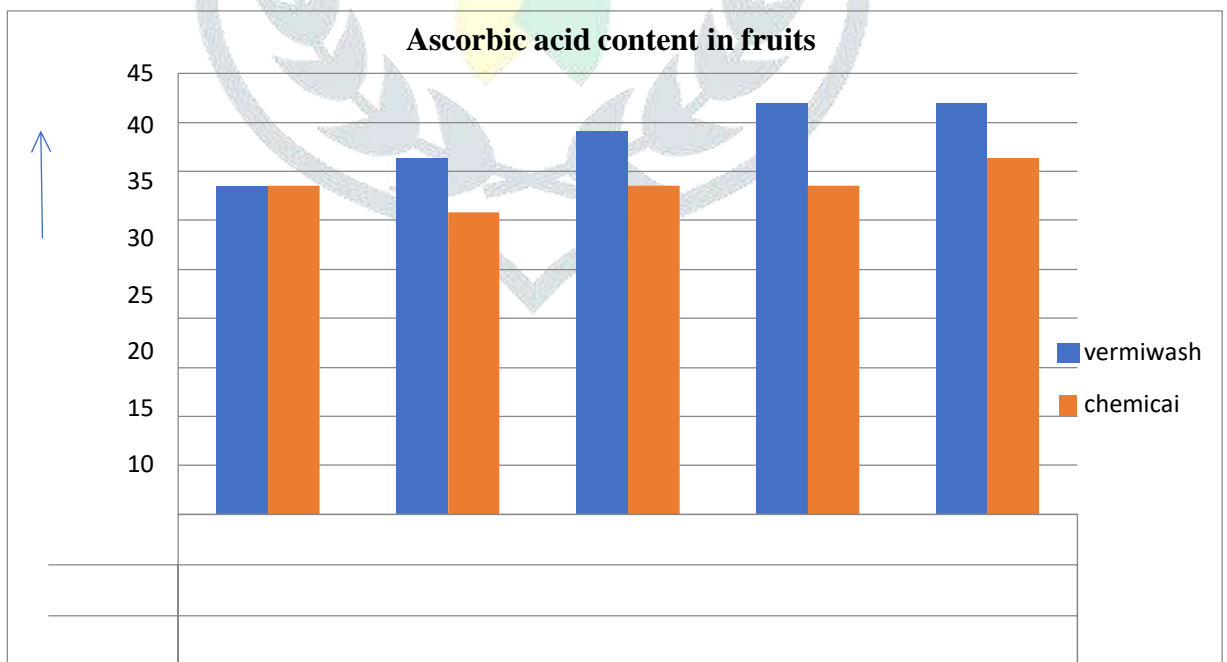
Effect of different concentration of chemical fertilizer on fruit length of chilli plant.

Chlorophyll estimation



Effect of different concentration of vermiwash and chemical fertilizer on total chlorophyll (mg/g) of chilli.

Ascorbic Acid



Effect of different concentration of vermiwash and chemical fertilizer on ascorbic acid (mg/100gm) in chilli.

Conclusion:

The organic nutrient in vermiwash its significance of its utilization as compost in agriculture. The effect of different concentration of vermiwash and chemical fertilizer on growth, yield and quality parameters of chilli (*Capsicum annuum* L.) variety of chilli is Pusa-jwala. All the parameters like growth, yield and quality of chilli shows better result in vermiwash as compare to chemical fertilizer. And lowest result was shown in the control as compare to both vermiwash and chemical fertilizer treatment. vermiwash better utilization as compost for better crop production and can be good.

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