



**RESPONSE OF PHULE JYOTI (*CAPSICUM ANNUUM* L.) CULTIVAR TO FOLIAR APPLICATION OF BLUE GREEN ALGAL EXTRACT, BIOFORCE, AMRUTA AND RECOMMENDED DOSE.**

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**ABSTRACT**

Investigation to study the effect of Blue-green algal extract, Bioforce, Amruta (19:19:19) and recommended dose (NPK) as foliar sprays on growth of chilli Phule-Jyoti was carried out on farmers field at Yeole Akhada village of Ahmednagar district. The experiment was laid out in randomized block design with three replication. This experiment consists of eight foliar spray treatments. Among the treatments, foliar application of blue-green algal extract was significantly superior to other treatments in increasing the yield of chilli fruits. The highest yield of chilli 171 q/ha. was recorded with the application of blue-green algal extract.

**KEYWORD:** Chilli, BGA, Bioforce, Amruta, Recommended dose, Foliar spray, Yield.



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## INTRODUCTION

Chilli (*Capsicum annuum* L.) is one of the most important vegetable crop used in our daily diet. Fruit have pungency due to volatile alkaloid, oleoresin capsaicin which is widely used for medicinal purpose. Chilli as a vegetable is used for its pungency, spicy taste beside the appealing colour it adds to the food. It also used in the different forms, such as spices, condiments, sauces and pickles. Considering the importance of chilli in daily diet and its demand for export as a condiment and for medical purpose, increase the production by bringing more area under cultivation and increasing yield per unit area of the cultivation has prime importance. In India, chilli is grown over an area of 917.6 thousand hectares with an annual production of 779.6 thousand metric tons of dry chillies while in Maharashtra the total area under this crop is about 132.7 thousand hectares with the production of 68.40 thousand metric tons (Anonymous 1996). Contemporary agriculture has managed to increase the productivity of Horticultural crop with the minimum use of plant nutrients. However, the intensive application of chemical fertilizers deteriorated the soil productiveness and distributed the biological balance of biodiversity (Hansra, 1993). Hence the current effort is to explore the possibility of an alternative for chemical fertilizers. There are many evidences for the presence of growth hormones in many algal members (Thiman *et al.* 1942; Knight, 1947; Williams, 1947; Burrows, 1956; and Bentley, 1958), but their effect on the growth of crops has not been investigated. As the green revolution is started in agriculture the concept of the use of fertilizers for enhancing growth and yield of crop is changed. Instead of application of fertilizer to the soil various kinds of fertilizers in the form of liquid are sprayed on plant. Such types of liquid fertilizers are

found to be more beneficial than the soil application. Therefore, an attempt was made to assess potentiality of some blue-green algal extract on economically significant crop plant like Chilli. The present work was carried out to determine the nature and extent of effects on growth and yield of vegetable crop like Chilli, due to spraying of blue-green algal extract as a liquid biofertilizer in the form of foliar spray.

## MATERIALS AND METHODS

The present investigation on Chilli. (*Capsicum annuum* L) var. Phule Jyoti was carried out during 2006-07. Materials used and methods followed during the investigation are described in the succeeding paragraph.

### A) Materials

i) The seeds of Chilli. (*Capsicum annuum* L.) var. Phule Jyoti were obtained from All India Co-ordinated Vegetable Improvement Project on MPKV, Rahuri.

### B) Methods

- i) Mass cultivation: Simple pit method (Venkatraman, 1969).
- ii) Algal extract: Bhosale *et al.* (1975).
- iii) Algal concentration : (Table 1)
- iv) Plan of layout: Factorial Randomized Block Design (FRBD) with seven treatments, which were replicated thrice.
- v) Plot size
 

Season	: Kharif
Gross plot size	: 3.4 x 2.8 m <sup>2</sup>
Net plot size	: 2.4 x 2.7 m <sup>2</sup>
Spacing	: 60 x 45 cm
Crop variety	: Phule Jyoti
Total plants per plot:	24
Source of irrigation:	Well and canal.

**Table 1**  
**Concentration percentage of algal extract, Bioforce, Amruta (19:19:19) and recommended dose applied on Tomato.**

Sr. No.	Treatment	Symbol	Concentration percentage	Remark	
				Spraying	Time of spraying (DAS)
1.	<i>Nostoc calcicola</i> extract	T <sub>1</sub>	5-20	1 <sup>st</sup> spraying	Pre flowering
2.	<i>Lyngbya majuscula</i> extract	T <sub>2</sub>	5-15		
3.	<i>Scytonema millei</i> extract	T <sub>3</sub>	15-20		
4.	<i>Oscillatoria subbrevis</i> extract	T <sub>4</sub>	5-15	2 <sup>nd</sup> spraying	At flowering
5.	Bioforce	T <sub>5</sub>	2 ml/lit		
6.	Amruta (19:19:19)	T <sub>6</sub>	0.5 g/lit		
7.	Recommended dose (NPK) kg/ha	T <sub>7</sub>	150:120:125	3 <sup>rd</sup> spraying	Post flowering
8.	Control	T <sub>8</sub>	Distilled water		

vi) Growth and yield parameters such as plant height, number of branches, number of leaves, plant spread (cm), days for flower initiation, days required for 50% flowering, length of fruits, diameter of fruit, number of fruits per plant, weight of fruit per plant and yield of crop (q/ha) were recorded by using standard methods. Then the yield per hectare was calculated.

## RESULTS AND DISCUSSION

Foliar application of various compounds (Algal extract, Bioforce & Amruta) had a significant influence on plant height, number of leaves and branches, plant spread and yield characters like days for flower initiation, 50% flowering, length and diameter of fruit, number of fruit, fruit weight and yield of crop (Table 2). Foliar application of BGA extract and two commercial preparation, Bioforce (an organic liquid vitaliser) and Amruta (100% water soluble fertilizer 19:19:19) performed better than control in improving the growth, yield attribute & yield of chilli. Between the two commercial preparations tried, Bioforce performed better than Amruta, but blue green algal extract like *Nostoc calcicola* extract recorded the tallest plant height [75.14 cm], highest number of Leaves [440], number of branches [11.80], plant spread [58.13cm], diameter of fruit [1.26 cm], number of fruit per plant [238.73], weight of fruit per plant [678.33g] and fruit yield [171.00 q/ha]. However maximum days required for flower initiation [41.66] and 50% flowering [66.33] recorded in recommended dose and minimum days required for flower initiation [34.00] and 15% flowering [59.00] recorded in *N. calcicola*.

On the contrary, unspread control [T8] registered the shortest plant height [43.64cm], lowest number of leaves [266], number of branches [7.40], plant spread [52.19cm], fruit length [8.50cm], fruit diameter [0.94cm], number of fruit per plant [197.26], fruit weight per plant [463.73g] and yield of crop [116.90 q/ha.]. These results are in consonance with the results of Khemnar [2001], Dandawate [2006], Mohite [2007] and Renukabei *et al.*, [2008] and Abhang [2010, 2012]. The blue green algal extract proved its superiority over the commercial available formulation in influencing the growth and yield of chilli. It is more vivid that algal extract application in crops promotes the proliferation of root and root hair formation [Mohan *et al.*, 1994, Gencer and Ay, 1997, Stephan *et al.* 1985.] Further the low molecular weight blue green algal extract reported to be directly absorbed by plant, when it is applied on foliage Khemnar, 2001; Mohite, 2007; Venkatraman Kumar and Mohan, 1997. It has been speculated that the treatment comparison of blue green algal extract application with Bioforce and Amruta had given significantly better results. This might be due to the stimulatory action of blue green algal extract that contain growth hormones (Knight, 1947; Burrows, 1955; weber, 1958 and Bently, 1958) which increased uptake from soil. Effective utilization of foliar applied nutrients promotes of photosynthesis and respiration contributed by the protein quinone groups respectively of accumulated blue green algal extracts.

**TABLE 2**  
**Response of Phule Jyoti (*Capsicum annuum* L) Cultivars to Foliar Applications of Blue Green Algal Extract Bioforce Amruta and Recommended Dose.**

Treatments	Symbol	Plant height (cm)	No. of expanded leaves	No. of Branches	Plant spread (cm)	Days for flower initiation	Days required for 50 % flowering	Length of fruits (cm)	Diameter of fruits (cm)	No. of fruits per plant	Weight of fruit per plant (g)	Yield of crops q/ha
<i>Nostoc</i> extract	T <sub>1</sub>	75.14	440	11.80	58.13	34.00	59.00	10.20	1.26	238.73	678.33	171.00
<i>Lyngbya</i> extract	T <sub>2</sub>	70.47	337	10.00	56.06	38.66	61.00	09.80	1.20	217.53	620.80	156.50
<i>Scytonema</i> extract	T <sub>3</sub>	75.55	407	11.13	57.43	34.33	60.00	10.10	1.16	227.00	624.96	157.55
<i>Oscillatoria</i> extract	T <sub>4</sub>	70.20	320	09.80	55.90	38.66	60.66	9.70	1.13	211.13	568.66	143.35
Bioforce	T <sub>5</sub>	65.25	310	09.54	54.57	40.33	61.00	9.50	1.10	209.40	565.20	142.48
Amruta (19:19:19)	T <sub>6</sub>	58.65	313	09.46	52.67	41.00	63.00	9.20	1.04	208.40	561.20	141.47
Recommended dose	T <sub>7</sub>	55.15	290	09.13	52.19	41.66	66.33	9.20	1.00	207.80	550.93	138.88
Control	T <sub>8</sub>	43.64	266	07.40	46.65	42.33	68.33	8.50	0.94	197.26	463.73	116.90
Mean		64.231	335.78	9.783	54.200	38.876	62.04	9.525	1.10	214.66	579.22	146.02
S.E		0.165	3.279	0.508	0.153	0.552	0.857	0.130	0.019	0.546	0.254	45.17
CD 5 %		0.490	9.738	1.510	0.454	1.640	2.547	0.387	0.058	1.624	0.757	134.14
CD 1 %		0.672	13.355	2.070	0.623	2.249	3.493	0.531	0.079	2.227	1.038	183.97

## CONCLUSION

The present investigation clearly conclude that, by using the low cost technology i.e. use of blue green algal liquid biofertiliser has exhibited its assorted influence on growth and yield with great boost over control as well as other commercial liquid fertilizer treatments. It was also observed that different blue green algal extracts proved to be superior in increase in height, leaves, branches, plant spread, length diameter of fruit, no. of fruits, fruits weight, yield of crops etc. so the inorganic fertilizers are known to be away from

this aspects and long term, algal organic fertilizer are more useful .

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