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## Evaluation of the efficacy of phytotonic on Bengal gram (*Cicer arietinum* L.)

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### Abstract

An experiment was conducted at Agriculture Research Station, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Achalpur (M.S.), India to study the efficacy of phytotonic (V) with time of application in Bengal gram at Achalpur, Amravati district of Maharashtra state during *Rabi* 2020-21. The foliar spray was applied at flowering, pod filling and flowering and pod filling stage at concentrations (2.0, 2.0 and 2.0 ml liter<sup>-1</sup> of water with RDF as common dose) of phytotonic (V). Foliar applications of phytotonic (V) significantly enhanced the growth and yield parameters. Plant height, mean number of pods and grain yield q/ha was found to be significant with various treatment after second spray count. However non significant results recorded with parameter number of branches. Highest plant height (52.95 cm), mean number of pods (23.75) and grain yield (22.09 q ha<sup>-1</sup>) was recorded with treatment RDF + phytotonic (V) - 2 ml litre<sup>-1</sup> at flowering and pod filling stage.

**Keywords:** RDF, Bengal gram, phytotonic

### Introduction

Chickpea (*Cicer arietinum* L.) commonly known as gram or Bengal gram is the most important pulse crop. Chickpea finds many uses. It is mainly used for human consumption. Green leaves are used as nutritious and palatable and pot herb or leafy vegetable. Unripe seeds are eaten raw, boiled and spiced eatable and cooked vegetable. Sprouted, spiced and salted seeds are eaten with great relish. Crushed seeds are used various sweet preparation and handmade bread. Roasted seeds as such or with papped rice are commonly eaten. Water soaked seeds, its husk and broken bits form a nutritious animal feed. Gram plants and dried stalks form excellent fodder for cattle. The crop is also used for green manuring and soil fertility improvement and as a cover crop against soil erosion (Majumdar, 2011) [4].

Any improvement in agricultural system that results in higher production should reduce the negative environmental impact and enhance the sustainability of the system. One such approach is the use of phytotonic, which can enhance the effectiveness of conventional mineral fertilizers. Long-term indiscriminate

use of them invites the crucial problem of soil health disorder vis-à-vis reduced input use efficiency, more precisely, fertilizer use efficiency. Due to these reasons

the farmers are being compelled gradually day by day to turn towards various options like organic manures, bio-stimulants, growth regulators, phytotonic etc. One of such options is the use of phytotonic as plant nutrient bearing fertilizer. Hence, with a view to study the efficacy of phytotonic (Vincent) with time of application in Bengal gram, the present experiment was undertaken.

### Materials and Methods

The experiment was conducted during 2020-21 at Agriculture Research Station, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Achalpur on Jaki-9218 variety in randomized block design (RBD) and replicated four times. The experiment comprised of five treatments, the details of the treatments are mentioned in Table 1. The treatments were distributed in a randomized block design with four replications. The gross plot size was 2.40 × 3.00 m and net plot size was 1.80 × 2.80 m. The recommended dose of fertilizer (RDF) for Bengal gram was 25:50:30 kg ha<sup>-1</sup> N, P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O, respectively and all fertilizers were applied as basal. Date of sowing was 12<sup>th</sup> of November, 2020 and the crop was harvested on 16<sup>th</sup> April, 2021. Observations were recorded on growth and yield regularly and statistically analyzed as per the methods given by Panse and Sukhatme (1967) [5].

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## Results and Discussion

A field experiment was designed for the influence of phytotonic (V) on different growth parameters of Bengal gram at field conditions of Agriculture Research Station, Dr. PDKV, Achalpur, Dist. Amravati, Maharashtra, during the year 2020-21.

The plant height increases significantly. Variation shown in Table 1. The highest plant height was recorded in treatment T<sub>3</sub> (RDF + phytotonic (V) - 2 ml litre<sup>-1</sup> at flowering and pod filling) (52.95cm) followed by T<sub>4</sub>: RDF (25:50:30 kg N, P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O ha<sup>-1</sup>) (50.70 cm) and the minimum was recorded in treatment T<sub>5</sub>: Water spray only (45.30 cm). This finding was supported by Biswajit Pramanick *et al.*, 2013 <sup>[1]</sup>.

The non significant maximum number of branches was

observed due to the phytotonic Vincent of T<sub>3</sub>: (RDF + Vincent 2 ml/litre at flowering and pod filling) (3.50 per plant) and least was recorded in control T<sub>5</sub>: (Water spray only) (3.20 per plant).

Significantly maximum mean number of pods was recorded in T<sub>3</sub>: (RDF + Vincent 2 ml/litre at flowering and pod filling) (23.75) and the least mean number of pods was recorded in control T<sub>5</sub>: water spray only (13.63).

Significantly the highest grain yield was recorded in T<sub>3</sub>: (RDF + Vincent 2 ml/litre at flowering and pod filling) (22.09 q/ha). The lowest grain yield was 12.73 q/ha associated with control T<sub>5</sub>: water spray only.

The result of the present investigation conforms by Biswajit Pramanick *et al.*, 2013 <sup>[1]</sup>.

**Table 1:** Effect on plant height and number of branches of Bengal gram after phytotonic (V) spray.

Treatments	Plant height (cm)	No. of Branches	Mean No of Pods plant <sup>-1</sup>	Grain Yield (q ha <sup>-1</sup> )
T <sub>1</sub> : RDF + phytotonic (V) - 2 ml/litre at flowering	49.30	3.25	21.13	19.67
T <sub>2</sub> : RDF + phytotonic (V) - 2 ml/litre pod filling	50.20	3.40	21.63	20.14
T <sub>3</sub> : RDF + phytotonic (V) - 2 ml/litre at flowering and pod filling	52.95	3.50	23.75	22.09
T <sub>4</sub> : RDF (25:50:30 kg N, P <sub>2</sub> O <sub>5</sub> and K <sub>2</sub> O ha <sup>-1</sup> )	50.70	3.35	21.13	19.69
T <sub>5</sub> : Water spray only	45.30	3.20	13.63	12.73
SE m ±	1.27	0.08	1.93	1.83
CD at 5%	3.63	NS	5.53	5.23

**Results:** Plant height mean number of pods and grain yield q ha<sup>-1</sup> was found to be significant with various treatments after second spray count. However non significant results recorded with parameter number of branches. Highest plant height (52.95 cm), mean number of pods (23.75) and grain yield (22.09 q ha<sup>-1</sup>) was recorded with treatment T<sub>3</sub>: RDF + phytotonic (V) - 2 ml litre<sup>-1</sup> at flowering and pod filling. Application of phytotonic (V) 2 ml liter<sup>-1</sup> spray at flowering and pod filling recorded highest yield.

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