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INFLUENCE OF BIO-FERTILIZERS ON GROWTH ATTRIBUTES OF GUAR (*CYAMOPSIS TETRAGONOLOBA* L.)

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Abstract

A field experiment was carried out during kharif season 2014-2015 using randomized complete block design with three replications to study the effect of biofertilizers in conjunction with neem cake on growth attributes of guar. Combined inoculation of both bio fertilizers with neem cake was most promotive for all the growth attributes than the sole effect of any of the treatments. The average height & number of leafs was significantly higher in (FYM+Rhizobium+ Pseudomonas fluorescence) and in (Neem Cake + Rhizobium + Pseudomonas fluorescence) treatments than all other treatments. Plant height and no. of leafs per plant were almost double in Bio-fertilizers treatment than under control. Inoculation of bio-fertilizers solely or in combinations increases the plant height due to more nutrient availability. Application of bio-fertilizer with neem cake and FYM increased all the growth attributes as compared to control.

Key words : *Cyamopsis tetragonoloba*, Bio-fertilizers, FYM, neem cake.

Introduction

Cyamopsis tetragonoloba or cluster bean (Guar) belongs to the family Fabaceae (Leguminaceae) is a drought tolerant summer annual legume and it is cultivated as a feed crop for human and livestock consumption. The green tender pods are consumed as vegetable. It is also grown as green manuring crop. Seeds contain gum like mucilaginous substance called 'Guar Gum' or galactomannan. Guar contains many important nutrients and phytochemicals such as saponin and flavonoids and is well-known traditional plant used in folklore medicine Inoculation of appropriate strains of rhizobia to legumes known to enhance yield, but both success and failures at field experiments have been documented (Ibrahim *et al*., 2016; Patil, 2014). The objective of this research study is to investigate the effect of inoculation with biofertilizers, neemcake and FYM on growth and yield of gaur crop.

Materials and Methods

A field experiment was carried out during kharif season 2014-2015 using randomized complete block design with three replications to study the effect of biofertilizers in conjunction with neem cake on growth attributes of guar. The block dimensions were 10x20mtr.sqr. The soil is having a pH of 7.58 with 0.88 per cent Organic carbon and low Nitrogen (68 Kg/ha). Seeds were sown at a spacing of 30 and 10 cm inter and intra row spacing, respectively. The seeds were inoculated with biofertilizers, which comprised of the combination bio-fertilizers such as Rhizobium sp., Pseudomonas fluorescence (PS) with neem cake and farm yard manure (FYM). In all their were twelve treatments $\mathbf{T_1}$- Control, $\mathbf{T_2}$- Rhizobium (RH), $\mathbf{T_3}$- Pseudomonas fluorescence (PS), $\mathbf{T_4}$- Farm yard manure (FYM), $\mathbf{T_5}$- Neem cake (NC), $\mathbf{T_6}$- RH+PS, $\mathbf{T_7}$- FYM+RH, $\mathbf{T_8}$- FYM+PS, $\mathbf{T_9}$- NC+RH, $\mathbf{T_{10}}$-NC+PS, $\mathbf{T_{11}}$- FYM+RH+PS, $\mathbf{T_{12}}$- NC+RH+PS. Observations were recorded on growth and yield parameters of Gaur.

Results and Discussion

The data presented in table 1 revealed that the vegetative as well as yield and yield attributing characters significantly influenced by different biofertilizer used alone or in combination. Significantly maximum plant height (99.90cm) at 60 days after sowing, number of branches (8.66) at 60 days after sowing, number of leaves (26.76) at 60 days after sowing T11 was recorded by receiving application of - FYM+RH+PS (farm yard manure + Rhizobium + Pseudomonas fluorescence). Similarly, number of clusters/plant was recorded maximum (17) in

Table 1 : Growth attributes of Guar as influenced by various treatments.

Treatment	Plant height (cm)	Branches/plants	Leaves/plant	No. of clusters/ plant	Pods/plant
T_1	74.4	7.8	25.5	15.6	57.93
T_2	74.9	7.8	25.8	15.1	60.6
T_3	76.9	8.0	25.3	15.5	60.6
T_4	87.8	8.4	26.1	15.7	57.9
T_5	87.9	8.3	26.3	16.0	57.8
T_6	83.7	8.4	26.4	16.4	58.9
T_7	87.9	8.3	26.1	16.7	59.8
T_8	85.6	8.5	26.5	16.4	59.5
T_9	78.8	8.4	26.3	16.6	61.5
T_{10}	86.7	8.5	26.4	16.5	60.6
T_{11}	99.9*	8.6*	26.7	17.0*	64.3*
T_{12}	90.6	8.5	26.5	16.7	63.3
CD P<0.05	3.5	0.5	0.2	0.8	3.7

T_{11} treatment followed by (16.7) in T_{12} treatment with an increase of 89.74% and 70% in T_{11} & T_{12}, respectively. Number of pods/plant was also recorded maximum in T_{11} & T_{12} which were 64.34 & 63.3, respectively. Balbhim L. Chavan *et al*. (2015) studied fertilizer treatments for the growth, yield and chemical contents of Cluster bean (*Cyamopsis tetragonolobus*) crop recorded significantly highest with application of vermicompost of FYM as compared to remaining treatments and then followed by treatment with chemical fertilizer. The co-inoculation of biofertilizers *i.e.* T_{11} significantly increased the yield parameters like pod yield per plant, pod yield per plot, pod yield per hector followed by T_{12} *i.e.* (NC+RH+PS),whereas minimum pod yield per plant pod yield per plot and pod yield per hectare was recorded by T_1 *i.e.* control (table 1).

Significant differences were observed in no. of seeds/ plant, dry seed weight (g/100), no. of pods/plant, average fresh weight/plant and pod/plant with treatment of FYM, Rhizobium, Pseudomonas fluorescence & neem cake applications. Similar findings have been reported by Gomaa and Mohamed (2007). Therefore, it is concluded that FYM along with both the biofertilizers can be recommended for better growth and yield of Guar.

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