

Response of summer clusterbean [*Cyamopsis tetragonoloba* (L.) Taub.] to organic fertilizers and different levels of sulphur for vegetable purpose

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ABSTRACT

A field experiment was conducted during summer season of 2008 at college farm. Navsari Agricultural University, Navsari to study the response of summer Clusterbean [*Cyamopsis tetragonoloba* (L.) Taub.] to organic fertilizers and levels of sulphur for vegetable purpose. Result of the experiment revealed that an application of Biocompost @ 5 t ha⁻¹ recorded significantly higher yield attributes *i.e.* Number of pods per plant (54.30), length of pods (8.88 cm) and weight of green pods per plant (254.56 g) which resulted in significantly highest green pod (5325 kg ha⁻¹) and straw (3137 kg ha⁻¹) yields. Similarly sulphur level also recorded significant effect in increasing all these yield attributes and yield. Sulphur application @ 50 kg ha⁻¹ produced significantly higher yield attributes and green pod (6071 kg ha⁻¹) and straw (3344 kg ha⁻¹) yield over other treatments.

Key words : Clusterbean, Biocompost, Sulphur, Yield attributes

INTRODUCTION

Clusterbean or guar is an important self pollinated, multipurpose, relatively drought resistant and restorative leguminous vegetable crop. It is grown for feed, fodder, vegetable, green manure as well as for gum production. Being legumes, it builds soil fertility and thus has a great role to play in nitrogen economy for succeeding crop. India leads the list of major guar producing countries of the world contributing to about 75 to 80 % in the world total production of around 7.5 lakh to 10 lakh tonnes. In India, the main states cultivating clusterbean are Rajasthan, Gujarat, Haryana, Punjab and Uttar Pradesh.

Yield in clusterbean is an integration of the effect of numerous factors on many physiological components. Looking to the soil health and to sustain the productivity, use of judicious combination of organic and inorganic fertilizer is essential. The organic manures *i.e.* FYM, castor cake, biocompost, vermicompost, poultry manure, neem cake are well recognized, which supply necessary macro and micro plant nutrients for maintaining soil fertility. Application of sulphur not only increases the crop yield but also improves the crop quality *i.e.* it increases the oil and protein content, improves nutritional quality of fodder. For exploiting the potential yield of clusterbean use of organic fertilizers and sulphur application is necessary. Keeping in view the above facts the present investigation was, therefore, initiated to workout the response of organic and sulphur fertilizers on yield and yield attributes of clusterbean.

MATERIALS AND METHODS

A field experiment was conducted during summer season of 2008 at College Farm, Navsari Agricultural University, Navsari to study the response of clusterbean [*Cyamopsis tetragonoloba* (L.) Taub.] to organic fertilizers and different levels of sulphur for vegetable purpose. The soil of the experiment field was clayey in texture, low in available nitrogen (176 kg ha⁻¹), medium in available phosphorus (32 kg ha⁻¹), available sulphur (21.01 kg ha⁻¹) and fairly rich in available potassium (350 kg ha⁻¹) with 7.8 pH. Nine treatment combinations comprising of three levels of organic fertilizers *viz.*, Control (F₀), FYM @ 5 t ha⁻¹ (F₁) and biocompost @ 5 t ha⁻¹ (F₂) and three levels of sulphur *i.e.* Control (S₀), 25 kg S ha⁻¹ (S₁) and 50 kg S ha⁻¹ (S₂) were tried in factorial randomized block design with four replications. The Clusterbean variety Pusa Navbahar was sown on 29 February 2008 keeping 45 cm inter-row spacing and intra-row spacing of 15 cm was maintained by thinning operation. Recommended dose *i.e.* 20:40:00 kg NPK ha⁻¹ and other cultural practices were also adopted as per need of crop.

RESULTS AND DISCUSSION

The results obtained from the present investigation are summarized below :

Effect of organic fertilizers:

Data presented in Table 1 revealed that, different organic fertilizer treatment had significant effect on yield attributes and yield. Significantly higher number of pods per plant (54.30), length of pods (8.88 cm) and weight of

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Table 1 : Response of organic and sulphur fertilizers on number of pods per plant, length of pods, weight of pods per plant, green pod yield and straw yield of clusterbean

Treatments	Number of pods per plant	Length of pods (cm)	Weight of green pods per plant (g)	Green pod yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)
Organic fertilizers (F)					
F ₀ = Control	48.53	8.31	240.41	4178	2577
F ₁ = 5 t FYM ha ⁻¹	51.20	8.64	245.62	5098	2822
F ₂ = 5 t Bio-compost ha ⁻¹	54.30	8.88	254.56	5325	3137
S.E. ±	1.04	0.17	5.24	347	59.76
C.D. (P=0.05)	3.05	0.52	15.31	1013	174.44
Sulphur levels (S)					
S ₀ = Control	45.92	7.35	235.66	3632	2283
S ₁ = 25 kg S ha ⁻¹	52.03	8.96	246.71	4897	2909
S ₂ = 50 kg S ha ⁻¹	56.08	9.52	258.21	6071	3344
S.E. ±	1.04	0.17	5.24	347	59.76
C.D. (P=0.05)	3.05	0.52	15.31	1013	174.44
Interaction					
F X S	NS	NS	NS	NS	NS
C. V. %	7.20	7.06	7.36	14.72	7.27

NS-Non significant

green pods per plant (254.56 g) was recorded under application of biocompost @ 5 t ha⁻¹ but it was at par with application of FYM @ 5 t ha⁻¹. This was due to good nourishment and favorable effect of organics on plant growth in terms of dry matter accumulation in plant and translocation of photosynthates towards reproductive plant parts resulted in higher number of pods per plants. These findings are in close conformity with those of Singh (2002) and Meena *et al.* (2003) in clusterbean. Results further reported that biocompost created remarkable effects on green pod and straw yield of clusterbean. Significantly the highest green pod (5253 kg ha⁻¹) and straw (3137 kg ha⁻¹) yields were recorded with the application of biocompost @ 5 t ha⁻¹ over control. The improvement in green pod yield with the application of organic results into the beneficial effect of availability of nutrients leading to improvement in pod yield. Similar results were obtained by Meena *et al.* (2003) and Kumar *et al.* (2007).

Effect of sulphur levels:

The data on yield attributes and yield *viz.*, number of green pods per plant, length of pods, weight of green pods per plant, green pod yield and straw yield were significantly influenced by sulphur levels. It is evident from Table 1 that an application of sulphur @ 50 kg ha⁻¹ recorded significantly higher number of pods per plant (56.08), length of pod (9.52 cm) and weight of green pods per plant (258.21 g) over control while sulphur @ 25 kg ha⁻¹ was at par in case of weight of green pods per plant.

Similarly treatment receiving sulphur @ 50 kg ha⁻¹ produced significantly the highest green pod (6071 kg ha⁻¹) and straw (3344 kg ha⁻¹) yield over other treatments. Sulphur besides improving vegetative growth, also activate of certain vitamins and co-enzymes. These bio-activities of sulphur might have played important role in improving yield attributes like pods per plant, length of pod and weight of green pods and there by pod yield per plant ultimately pod and straw yield. These findings confirmed the earlier reports of Singh *et al.* (2006) and Singh and Mann (2007).

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