

Original Research Article

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**Effect of Sulphur Levels on Grain Yield of Clusterbean  
[*Cyamopsis tetragonoloba* (L.) Taub.] under Rainfed Condition in  
Hanumangarh District of Rajasthan, India**

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A field experiment was conducted to investigate the effect of sulphur levels on grain yield of clusterbean on the yield attributes of clusterbean in Hanumangarh District of Rajasthan. Result showed that the assessed technology of T3- Soil application of sulphur @ 40 kg per hectare recorded highest average grain yield (10.37 qtl/ha) and highest average net returns (Rs. 27,013 per ha) as compared to T2- Soil application of sulphur @ 20 kg per hectare and farmers practice. But T2- Soil application of sulphur @ 20 kg per hectare recorded highest average B: C ratio (3.23) as compared to T3- Soil application of sulphur @ 40 kg per hectare and farmers practice. The trials also built the relationship and confidence between farmers and scientist of Krishi Vigyan Kendra. Therefore, it is suggested that these factors may be taken care to increase the scientific temperament of the farmers.

**Introduction**

Clusterbean is an important arid legume crop locally known as 'Guar' belongs to the family Leguminosae and sub-family Papilionaceae. Gillete (1958) reported 'Tropical Africa' as its center of origin. Botanically Cluster bean is known as *Cyamopsis tetragonoloba* (L.) Taub.

The name gaur means gau ahar which indicates rich meal for cattle. It is an important rainy season drought resistant leguminous crop suited to dry farming areas and grown extensively on dry land of India. However, it cannot with stand under excessive moisture or water logging condition. Any improvement

brought about in the quality of crop will go long way deciding the future of this crop in India. The area under cluster bean seed production in India is about 2.95 million hectares with the production of 10.59 million tones with average productivity of 418.49 kg per hectare (Meena *et al.*, 2006). In India the state of Rajasthan, Haryana, Gujarat, Punjab and Uttar Pradesh are known to be the leading states for cultivation of cluster bean. Rajasthan contributed 70%, Haryana 12%, Gujarat 11%, Punjab 3% and other 4% of the total production in India (Anonymous, 2006-07).

Fertilizer is a kingpin to increase agriculture production. In India, during past three to four

decades, the use of fertilizers have been recognized as the most effective input for higher crop production to varieties and irrigation. Optimum fertilizer application is one of the well-established techniques for increase in crop productivity. Sulphur is now recognized as the fourth ranked nutrient followed by nitrogen, phosphorus and potash. It is also needed in large amount by pulse crops (Saraf, 1988). It's deficiency in India is widely spread particularly in high intensive cropping system. Sulphur is essential for synthesis of protein formation of chlorophyll and glycosides and nutritive quality of forages; vitamins and sulphur containing essential amino acids viz., methionine (21%), cystine (27) (Singh *et al.*, 2004). Sulphur also markedly enhanced the content of phosphorus, sulphur and gum in grain. Phosphorus and sulphur are reported to have synergistic effect on productivity of crops (Singh and Ram, 1989).

Keeping above facts in view, the present investigation was taken to study the "Effect of sulphur levels on grain yield of Clusterbean [*Cyamopsis tetragonoloba* (L.) Taub.] under Rainfed condition in Hanumangarh District of Rajasthan".

### **Materials and Methods**

Present study was conducted in 26 locations of Hanumangarh district of Rajasthan by Krishi Vigyan Kendra, Nohar, Hanumangarh-II during kharif 2013-14 to 2015-16 (three consecutive years) for productivity enhancement of Clusterbean under On Farm Testing. There were 3 treatments i.e. T1- Farmers practice (No use of sulphur), T2 – Soil application of sulphur @ 20 kg per hectare and T3 – Soil application of sulphur @ 40 kg per hectare. Each treatment conducted in 0.25 hectare area (0.75 hectare area per trial). Parameter of assessment was grain yield.

## **Results and Discussion**

### **Performance of OFTs (On Farm Trials)**

The finding of the study revealed that the assessed technology of use of sulphur grain yield was increased of clusterbean (Table 1). Result showed that the assessed technology of T3: Soil application of sulphur @ 40 kg per hectare highest average grain yield was recorded (10.37 qtl/ha) as compared to average yield T2- Soil application of sulphur @ 20 kg per hectare (10.04 qtl/ha) and farmers practice (8.54 qtl/ha).

### **Economic analysis of OFTs (On Farm Trials)**

The economics of clusterbean production under trials were estimated and the results of the study have been presented in Table 2. The results of economic analysis of clusterbean production revealed that T3- Soil application of sulphur @ 40 kg per hectare a highest average net returns was recorded of Rs. 27,013 per ha as compared to T2- Soil application of sulphur @ 20 kg per hectare practice (Rs.26,873 per ha) and farmers practice (Rs.20,253 per ha).

But T2- Soil application of sulphur @ 20 kg per hectare was recorded highest average benefit cost ratio (3.32) as compared to T3- Soil application of sulphur @ 40 kg per hectare (3.23) and farmers practice (2.82).

The present investigation was taken to study the effect of sulphur levels on grain yield of clusterbean. The finding of the study revealed that the assessed technology of T3: Soil application of sulphur @ 40 kg per hectare highest average grain yield was recorded (10.37 qtl/ha) as compared to average yield T2- Soil application of sulphur @ 20 kg per hectare (10.04 qtl/ha) and farmers practice (8.54 qtl/ha).

**Table.1** Performance of OFTs on “Effect of sulphur levels on grain yield of clusterbean”

S. N.	Treatment	Grain Yield (qtl/ha)			
		2013-14	2014-15	2015-16	Average
1	T1: Farmers practice (No use of sulphur)	9.33	10.50	5.80	<b>8.54</b>
2	T2: Soil application of sulphur @ 20 kg per hectare	11.25	12.38	6.50	<b>10.04</b>
3	T3: Soil application of sulphur @ 40 kg per hectare	11.40	12.50	7.20	<b>10.37</b>

**Table.2** Economic analysis of OFTs on “Effect of sulphur levels on grain yield of Clusterbean”

Net return (Profit) in Rs./ha				B:C ratio			
2013-14	2014-15	2015-16	Average	2013-14	2014-15	2015-16	Average
19,650	31,000	10,110	20,253	1.72	3.82	2.93	<b>2.82</b>
27,450	37,920	15,250	26,873	1.95	4.27	3.75	<b>3.32</b>
26,400	37,800	16,840	<b>27,013</b>	1.86	4.10	3.72	<b>3.23</b>

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