



Performance of Cluster beans (*Cyamopsis tetragonoloba* L.) for Yield and its Contributing Traits

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ABSTRACT

Cluster bean commonly called as Guar is grown in many parts of India for its tender pods. The present study was carried in Amritsar and Tarn Taran districts of Punjab state during 2020-21 to find the yield potential of four varieties of Cluster beans viz., AG 112, Thar Bhadavi, PVG-16 and HD 365. The variety PVG-16 showed better tender pods, number of pods per plant, good cooking quality and higher pod yield as compared to other varieties. Its pods are succulent. This variety outperformed in both location in terms of yield and its contributing traits.

Key Words: Cluster beans, Guar, Varieties, Yield, Pods cluster, Legumes.

INTRODUCTION

Cluster bean (*Cyamopsis tetragonoloba* L.) is one of the important underexploited leguminous vegetables belonging to family Fabaceae. It is commonly called by the names *Guar*, *Chavlikayi*, *Gorkayi*, *Khutt*, *Govar*, *Kothavare* in different parts of the country. It is a drought tolerant, hardy, deep rooted summer annual legume of high social and economic significance and mainly grown for tender vegetable and seed endospermic gum in arid and semi-arid regions of India. The quality of the crop like high adaptation towards erratic rainfall, multiple industrial uses and is important in cropping system for factors such as soil enrichment properties, low input requirement etc. have made the guar one of the most significant crops for farmers in arid areas in India. In India, Rajasthan stands first in terms of area and production of Cluster bean. The crop produces gum which is called guar gum and exported in foreign countries.

The cluster bean has sufficient nutrient profile especially rich in protein, vitamins A and C content and possesses several medicinal uses in diabetes and control of cholesterol content (Karawya *et al*, 1994). Guar is also used as green forage or as green manure crop which can enrich the soil by

fixing atmospheric nitrogen (50-60kg/ha) and by addition of organic matter (Lal, 1985). There is a significant difference in cluster bean genotypes in terms of yield and quality traits as reported by Arora *et al* (2011). Girish (2011) also reported wide variability for yield and quality traits among the genotypes of cluster bean. Gresta *et al* (2013) studied the effects of sowing times on yield and quality traits of cluster bean of four varieties of Guar (*Cyamopsis tetragonoloba* L.) in a Mediterranean Environment. Tiwari *et al* (2014) studied that the effect of fertility and sulphur levels on number of pods, yield and quality parameter of summer cluster bean (*Cyamopsis tetragonoloba* L.). Aamir (2015) reported that cluster bean (*Cyamopsis tetragonoloba* L.) germination and seedling growth as influenced by seed invigoration techniques. Therefore, the present study was conducted with the objective to study yield and its contributing traits in cluster bean varieties at different locations.

MATERIALS AND METHODS

The experiment was conducted at two locations as Location 1 (Krishi Vigyan Kendra, Amritsar) and Location 2 (University Seed Farm, Usman Tarn Taran during) 2021 to find out yield and its

Table 1. Pod yield and its contributing traits of cluster beans in district Amritsar.

Sr. No	Variety	Location 1 (Amritsar)		
		No. of Pods per plant	Number of pods per cluster	Pod Yield (q/ha)
1.	AG 112	61.00	4.40	57.36
2.	Thar Bhadavi	75.66	4.93	68.20
3.	PVG-16	92.66	5.60	80.70
4.	HD 365	53.00	4.53	57.26
	Range	53.00-92.66	4.40-5.60	57.26-80.70
	CD (p=0.05)	3.57	0.66	1.04
	CV	2.53	6.82	0.79
	GM	70.58	4.86	65.88

contributing traits of cluster bean varieties. The location 1 (Amritsar) representing Sub Humid region of Punjab and is located at 32.02°N and 75.24°E with a mean elevation of 241 m (791 ft). Amritsar, city is northern Punjab state of northwestern India. The location 2 (Tarn Taran) representing Semi Arid region of Punjab located at 30.9°N 75.85°E with a mean elevation of 244 m (798 ft).

The experiment materials for the present study consisted of four genotypes of cluster bean *viz.*, AG 112, Thar Bhadavi, PVG-16 and HD 365. The observations were recorded for yield and its contributing traits like number of pods per plant and number of clusters per pods. The experimental area was prepared well by deep ploughings and cross harrowing, leveling and then dividing the area into plots for each genotype in three replications. Beds were prepared of 60 cm width on base and 50 cm on top, alternating with 30 cm furrow. On these beds, two rows of guar were sown at a row to row spacing of 30 cm and intra row spacing of 15 cm. The 2-3 seeds per hill were sown with dibbling method and later thinning was done to maintain one plant per hill. The 20:16:10 (nitrogen: phosphorous: potassium) kg per acre were applied before sowing. Furrow irrigation was provided at weekly interval or as per need of the crop. The raised bed planting saves irrigation water and crop from adverse effect of heavy rainfall. The sowing was done during first fortnight of April at both of the locations on area of

25sqm area for each variety. The observations were recorded for different characters like days to days to first harvest, number of pods per plant, green pod yield per plant in grams. The data were statistically analyzed using ANOVA (Fisher, 1983).

RESULTS AND DISCUSSION

The results revealed significant differences of yield and its contributing traits in district Amritsar and Tarn Taran. At Location 1 (KVK Amritsar) the number of pods per plant ranged from 53.00 to 92.66 having mean of 70.58. The variety HD 365 showed 53.00 pods and variety PVG-16 showed 92.66 pods. The number of pods per cluster ranges from 4.40 to 5.60 having mean of 4.86. The variety AG112 showed 4.40 pods per cluster and variety PVG-16 showed 5.60 pods per cluster. The green pod yield ranged between 57.26 to 80.70 q/ha having mean of 65.88. The variety HD365 showed 57.26 q/ha yield and variety PVG-16 showed 80.70 q/ha yield (Table 1). The variation of cluster beans variety in terms of yield and its contributing traits has been reported by Bhadoria and Kushwaha (1995) and Kalyani (2012).

At Location 2 (Tarn Taran) the number of pods per plant ranges from 57.00 to 97.00 having mean of 70.75. The variety AG112 showed 57.66 pods and variety PVG-16 showed 97.00 pods. The number of pods per cluster ranges from 4.43 to 5.95 having mean of 5.00. The variety AG112 showed

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Table 2. Pod yield and its contributing traits of cluster beans in district Tarn Taran.

Sr. No	Variety	Location 2 (Tarn Taran)		
		No. of Pods per plant	Number of pods per cluster	Pod Yield (q/ha)
1.	AG 112	57.66	4.43	53.66
2.	Thar Bhadavi	71.33	4.73	68.13
3.	PVG-16	97.00	5.95	82.26
4.	HD 365	57.00	4.90	54.20
	Range	57.00-97.00	4.43-5.95	53.66-82.26
	CD (p=0.05)	1.37	0.50	2.28
	CV	0.97	5.05	1.77
	GM	70.75	5.00	64.56

4.43 pods per cluster and variety PVG-16 showed 5.95 pods per cluster. The green pod yield ranged from 53.66 to 82.26 q/ha having mean of 64.56. The variety AG112 showed 53.66 q/ha yield and variety PVG-16 showed 82.26 q/ha yield (Table 2). Significant difference among guar cultivars for yield has also been reported by Vahidy and Yousufzai (1999) and Singh *et al* (2006). Modaihsh *et al* (2007) also reported a significant increase in yield by nitrogen application in beans. Significant differences among guar cultivars for yield have also been reported by Saleem *et al* (2002). Singh *et al* (2021) studied variation in yield and contributing traits in pigeonpea and found that variety LRG41 suitable gave higher yield and suitable for fallow and uncultivable land. (Daniel *et al*, 2019) also reported variability for short duration of red gram variety for yield.

CONCLUSION

The results revealed that out of four varieties, the variety PVG-16 showed better tender green pods having higher pod yield and number of pods per plant as compared to other varieties. Its pods were succulent followed by variety Thar Bhadavi.

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Received on 19/2/2022

Accepted on 20/3/2022