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SHORT COMMUNICATION

EVALUATION OF CLUSTER BEAN GENOTYPES IN SUMMER FOR YIELD AND ITS CONTRIBUTING TRAITS UNDER HARYANA CONDITIONS

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SUMMARY

The material for the present study comprised ten cluster bean genotypes. The present experiment was conducted at Research Area, Forage Section, Department of Genetics and Plant Breeding, CCSHAU, Hisar during summer 2015 in randomized block design with four replications. The results of present study revealed that genotype HG 2-20 (618 kg/ha) out yielded significantly in grain yield followed by RGC 1066 (526 kg/ha), GAUG 825 (525 kg/ha), RGC 1017 (420 kg/ha) and RGS 05 (401 kg/ha). Therefore, HG 2-20 may be recommended for commercial cultivation under Haryana conditions during summer.

Key words : Summer Guar, Yield performance, Photo insensitive, Thermo insensitive

Cluster bean {Cyamopsis tetragonoloba (L.)} popularly known as *Guar* belongs to family Leguminaceae and sub family Papilionaceae. It is an annual crop with long and deep roots and well developed lateral branches, cultivated mainly as rainfed crop in arid and semi-arid regions during rainy season (Jitender *et al*., 2014). Guar crop effectively match with low and erratic rainfall pattern and high ambient temperature habitats of arid regions. The crop may thrive very well in rainfall range of 250 mm – 450 mm with 3- 4 spells, temperature range of 25°C - 40°C, RH values of 50% – 65%, longer and warmer days with 8-9 hr sun shine, particularly at maturity. Guar is suitable for light to medium textured soils, with no water logging (Kumar, 2014).

It is a multipurpose arid legume grown for seed, green fodder, vegetable and green manuring. It has attained the status of a commercial crop as its seeds are the source of high quality galacto-mannan gum and its guar meal is rich in protein (40-45%) which is used as animal feed. India is the major producer of the guar gum in the world, enabling its export to more than 65 countries. The export has earned a sum of Rs. 9480 crores by exporting 665177.74 MT of guar gum in 2014-15 (Indiastat, 2015). Rajasthan ranks first in respect of area of cultivation. In year 2014-15 the area of Haryana under guar cultivation was 406000 hectares with an average yield of 832 kg/ha and total production of 338000 tonnes of guar grain (Anonymus, 2016).

Cluster bean (Guar) is an important legume crop for the arid and semi-arid regions of Haryana. It has been grown in the **kharif** season in the state. In arid reigons of the state during **rabi** season Raya is widely grown which is generally harvested till the end of February. After that, fields generally remain fallow till **kharif** season in which sowing mainly depends on the onset of monsoon. In those areas during this period guar can be taken as summer crop provided there be availability of at least one life saving irrigation. For this the varieties must be bred in such a way that they possess earliness, better adaptability, resistance to drought, photo and thermo insensitivity with efficient root system and nodulation.

The material for the present study comprised ten clusterbean genotypes. The present experiment was conducted at Research Area, Forage Section, Department of Genetics and Plant Breeding, CCS HAU, Hisar situated at 29° 10' N lattitude and 75° 46' E longitude during summer 2015 in randomized block design with four replications. The texture of experimental upper soil layer was sandy loam. The weather parameters were also recorded during summer 2015 which have been shown in Fig. 1. After applying pre-sowing irrigation, the experiment was sown on March 23, 2015 with all

TABLE 1
Mean performance of yield and yield contributing traits of ten different genotypes of guar during summer 2015

S. No.	Genotypes	Seed Yield (kg/ha)	Days to 50% flowering	Days to maturity	Plant height (cm)	Branches/ plant (no.)	Pods/ plant (no.)	Seeds/ pod (no.)	100-seed weight (g)
1.	RGC 1038 (c)	258	36	108	86	8	18.25	6.25	2.32
2.	HG 2-20	618	37	102	101	9	41.25	6.75	2.18
3.	GAUG 825	525	38	101	108	11	27.25	6.25	2.70
4.	RGC 1002	281	36	102	92	10	25.25	6.5	2.34
5.	RGC 1066	526	35	102	107	2	37.25	7.5	2.62
6.	RGS 05	401‘	34	104	88	4	16.75	5.25	2.66
7.	RGC 1017	420	37	103	96	8	17.25	6.75	2.30
8.	RGS 03	282	37	114	78	4	18.5	7.25	2.58
9.	RGC 936 (c)	225	34	114	95	10	19	6	2.10
10.	RGC 06	389	36	112	96	8	19	6	2.24
	Range	225-618	34-38	101-114	78-108	2-11	16.75-41.25	5.25-7.50	2.10-2.70
	C. D. (P=0.05)	34.2							
	C. V. (%)	7.1							

recommended package of practices to raise a healthy crop. Each genotype was sown by hand plough in eight rows with plot size of 2.4 X 4 m2. Observations were recorded on five randomly selected competitive plants of each genotype from each replication for yield and its component traits *viz*. days to 50% flowering, days to maturity, plant height (cm), branches per plant (no.), pods per plant (no.), seeds per pod (no.), 100-seed weight (g) and grain yield (kg/ha). The analysis of variance to test the significance was carried out as per methodology given by Panse and Sukhatme (1967).

Grain Yield (kg/ha)

The results of present study (Table 1) revealed that genotype HG 2-20 (618 kg/ha) out yielded significantly in grain yield followed by RGC 1066 (526 kg/ha) and GAUG 825 (525 kg/ha). It was also observed that temperature higher than the optimum shorted the growing period of clusterbean, resulting in low grain yield as well as low biomass accumumation. Moreover, reduction in yield was not uniform in all the genotypes. Out of all the genotypes studied, HG 2-20 exhibited lowest reduction under summer cultivation. Therefore, HG 2-20 may be recommended for commercial cultivation during summer in Haryana, after its testing for few seasons.

Yield Contributing Traits

The results of present study revealed that the genotypes GAUG 825 (101 days) was earliest at maturity followed by HG 2-20, RGC 1002 and RGC 1066 maturing at 102 days after sowing. Maximum, plant height (108 cm) and number of branches per plant (11) were found in genotype GAUG 825. Numbers of pods per plant were found maximum in HG 2-20 i.e. 41.25. Maximum number of seeds per pod were found in RGC 1066 i.e. 7.5. But, 100 seed weight was found maximum (2.70 g) in GAUG 825. Above mentioned findings were also supported by Shabarishrai *et al*., (2012), Akhtar et al. (2012), Omvir & Singh, (2015), Hajari *et al*. (2015).

CONCLUSION

The cultivation of guar is possible in summer season also if there is a provision of one or two irrigation. Apart from that there is need to breed guar in such a way that it become determinate, early maturing, thermo and photo insensitive in order to fit it into the summer season cultivation. However, on the basis of present findings it may be concluded that HG 2-20 may be recommended for commercial cultivation during summer season in Haryana after its testing for few seasons.

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