Int.J.Curr.Microbiol.App.Sci (2018) Special Issue-7: 5293-5295

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 **Special Issue-7 pp. 5293-5295**
Journal homepage: http://www.ijcmas.com

Original Research Article

Studies on Evaluation of French bean (*Phaseolus vulgaris* L.) Genotypes for Sustainable Production in Rohtas Condition

Ratan Kumar[1*], Alok Bharti[2], D. Mandal[3], Arvind Kumar[4] and R. K. Sohane[5]

[1]SMS (Hort.), Krishi Vigyan Kendra, Rohtas, BAU, Sabour, Bhagalpur, Bihar, India
[2]SMS (Animal Sc.), Krishi Vigyan Kendra, Rohtas, BAU, Sabour, Bhagalpur, Bihar, India
[3]SMS (Agronomy), Krishi Vigyan Kendra, Rohtas, BAU, Sabour, Bhagalpur, Bihar, India
[4]Krishi Vigyan Kendra, Rohtas, BAU, Sabour, Bhagalpur, Bihar, India
[5]Director Extension Education, BAU, Sabour, Bhagalpur, Bihar, India
**Corresponding author*

A B S T R A C T

An experiment was conducted at farming system research and development at KVK, Rohtas farm and two other location village & Block-Nasriganj and Block-Sasaram, Village-Mohaddiganj during 2013-14 & 2014-15 to evaluate the suitable varieties (genotype) of French bean for maximum yield. The present On Farm Trial was undertaken to ascertain the production potential of different genotypes of French bean viz. Contender, Pusa Parvati, Pant Anupma, Arka Komal and Premier under Rohtas condition. From the results it was concluded that the genotype Pant Anupma and Pusa parvati which gave maximum pod yield (162.6 Q/ha) and (134.8 Q/ha) and better for other characters can be recommended for Rohtas condition.

Keywords

Evaluation, bean genotype, Rohtas

Introduction

French bean (*Phaseolus vulgaris* L.) is one of the most important vegetable crop of India, Choudhary (1987). It is commonly known as Farashi sheem or Jhar sheem in Bengali (Roy *et al.*, 2006) belongs to the family Fabaceae in an annual diploid (zn = 2x = 22) species (Galvan *et al.*, 2003). It is a dual purpose crop grown as vegetable and pulses. It is an important legume crops. Its dry seeds contain 21.1 per cent protein, 69.9 per cent carbohydrates, 1.7 per cent fat, 381 mg calcium, 425 mg phosphorus and 12.4 mg iron per 100 g of edible part (Ali and Kushwaha, 1987). It is also reported that common bean is an important source of protein and calories in human diets (Smithson *et al.*, 1993).

French bean is becoming popular for its tender pods and sheked beans. Besides it maintains soil fertility through biological nitrogen fixation in association with symbiotic Rhizobium prevalent in their root nodules. The suitable variety in appropriate soil is the two important factors for higher crop production (Dhanjal *et al.*, 1996). In Rohtas condition generally raised as an off-season vegetable crop. A number of high yielding well adopted genotypes have been identified in the past (Bose and Sen, 1986)

and were made available to the farmers but further evaluation is needed to select the suitable genotypes for increasing the production to a desirable level. With this in view present investigation was conducted to select the suitable genotypes under Rohtas condition.

Materials and Methods

The present experiment was carried out at the Krishi Vigyan Kendra, Rohtas, Bikramganj during spring season of 2013-14 and 2014-15 with five French bean genotypes namely Contender, Pusa Parvati, Pant Anupma, Arka Komal and Premier.

All these entries were grown in Randomization Block Design (RBD) with three replications. Each experiment plot was 3.60 m long and 3.00 m wide. The seeds were sown at a row to row distance of 60 cm and a plant to plant distance of 20 cm.

The recommended agronomical practices were followed for raising the crop. The data was recorded on ten competitive plant for the characters like pod yield (q/ha). These following observations are recorded: pod yield/plant, pods/plant, pod weight, pod length, pod diameter, plant height and days to maturity. The data recorded was subjected to statistical analysis as per the procedure given by Panse and Sukhatme, (1984).

Results and Discussion

The analysis of variance for eight characters revealed that for all these traits varieties differed significantly (Table 1). The mean square due to replication was significant in plant height only.

Future comparing the mean performance of different genotypes with their respective critical difference (Table 2). It was observed that the genotypes Pant Anupma had the maximum pod yield/plant (306.55 g) as well as per hectare (162.6 g) followed by Pusa parvati (258.18 g) and (134.8 q/ha) and Contender (212.92 g) and (108.4 q/ha). The number of pods/plant was also maximum in Pant Anupma (48.00) followed by Pusa Parvati (34.66) and Premier (28.66) the other genotypes viz. Contender and Arka Komal were statistically at par with each other for this trait. Maximum pod weight of 9.67 g was recorded in Contender followed by Arka Komal (9.03 g) and Pusa Parvati (7.43 g). The genotype Pusa Parvati had the maximum pod length and pod breadth followed by Contender and Arka Komal. Maximum plant height of 47.43 cm recorded in Arka Komal followed by Contender and Arka Komal. The late maturity genotypes were Premier and Pant Anupma. Similar findings in French bean have also been reported by Ram and Singh (1979); Gill *et al.*, (1972) and Thambura *et al.*, (1980).

Table.1 Pooled analysis of variance of three years data for design of experiment

Source of variation	df.	Pod yield (q/ha)	Pod yield/ plant (g)	Pods/ plant (nos.)	Pod weight (g)	Pod length (cm)	Pod dia. (cm)	Plant height (cm)	Days to maturity
Replication	2	409.13	169.71	0.066	0.151	0.16	0.001	2.83*	2.06
Genotype	4	23674.5	7891.54*	350.90*	6.36*	2.37*	0.031*	8.41*	40.76
Error	8	369.3	126.63	2.650	0.04	0.18	0.002	0.46	1.07

*Significant as 5 per cent level of significance.

Table.2 Pooled mean performance of French Bean genotypes for various characters

Genotype	Pod yield (q/ha)	Pod yield/ plant (g)	Pods/ plant (nos.)	Pod weight (g)	Pod length (cm)	Pod dia. (cm)	Plant height (cm)	Days to maturity
Contender	108.4	212.92	22.00	9.67	15.33	1.56	46.80	49.00
Pusa Parvati	134.8	258.8	34.66	7.43	16.16	1.68	46.20	46.00
Pant Anupma	162.6	306.55	48.00	6.48	14.43	1.67	44.36	55.00
Arka Komal	93.9	180.45	20.00	9.03	15.30	1.47	47.43	51.66
Premier	95.3	186.93	28.66	6.52	13.87	1.47	43.46	54.00
SE (m) ±	14.35	6.49	0.93	0.12	0.25	0.03	0.39	0.60
SE (d) ±	20.35	9.19	1.33	0.17	0.35	0.04	0.55	0.84
CD at 5%	51.14	21.13	3.06	.38	0.80	0.09	1.27	1.94

Based upon the result obtained from the present study, it was concluded that the genotypes Pant Anupma and Pusa Parvati can be taken up for raising successful crop of French bean under Rohtas condition of Bihar. This is useful for the farmers of Rohtas district who want a good genotype on Rohtas and Bihar condition.

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