

Varietal evaluation of garden pea under semi-arid conditions of Vidharba region

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ABSTRACT

An experiment was conducted to study the performance of different varieties of garden pea under Akola conditions at Department of Horticulture, Dr Panjabrao Deshmukh Krishi Vidyapeeth, Akola, Maharashtra. Eight varieties were evaluated on black soil in replicated randomized block design. All varieties exhibited considerable variation in their performance for most of the parameters. Better yield parameters in terms of number of green pods per plant, green pod weight, green pod length, green pod yield per plant and yield per hectare were noticed in all the varieties. Number of pods per plant was maximum in PB-89 (16.43) followed by Palam Triloki (13.9) and minimum in Jawahar Matar-2 (9.83). Similarly for pod character maximum pod weight was recorded in PB-89 (6.12 g) and minimum in Arka Kartik (3.27 g). Length of green pods was highest in variety PB-89 (10.4 cm) followed by Ankur (8.93 cm) and lowest was observed in Jawahar Matar-2 (5.8 cm). Green pod yield per plant was highest in PB-89 (87.93 g), Palam Triloki (75.45 g) and Ankur (68.42 g) whereas maximum pod yield per ha was recorded in PB-89 (93.12 q/ha) followed by Palam Triloki (76.97 q/ha). Among all the varieties highest protein and TSS content were recorded in Palam Triloki (23.06 and 17.67% respectively).

Keywords: Garden pea; varieties; yield; quality

INTRODUCTION

The field or garden pea, *Pisum sativum* L also known as Matar of the family Fabaceae is a cool season nutritive vegetable crop. The crop is very valuable in crop rotation. It is considered as an important cultivated legume next to soyabean, groundnut and beans. Pea is

highly nutritive containing high percentage of digestible protein along with carbohydrates and vitamins. It is also very rich in minerals and very common nutritious vegetable grown in the cool season throughout the world. The genus *Pisum* includes six to seven species mostly found in Mediterranean area and west Asia out of which only *P sativum* is cultivated.

In India pea is cultivated on an area of 420.90 thousand hectares with a total production of 4006.17 thousand tons (Anon 2012). Pea is very rich in protein (7.2 g), vitamin A (139 IU), C (9 mg), calcium (20 mg), phosphorous (139 mg), energy (81 kcal), carbohydrates (14.5 g) and sugars (5.67 g) per 100 g of edible portion. Large proportion of garden pea is processed for consumption in the off season. It is used as a soil building crop as chemical fertilizers are becoming less available and more expensive.

MATERIAL and METHODS

The experiment was conducted to identify potential varieties suitable for growing under semi-arid conditions of Vidharba region in Maharashtra. Akola is situated between 22.2°N latitude and 72.02°E longitude. The altitude of place is 307.2 m amsl. The experiment was initiated during winter (Rabi) season in 2013-14 at the main garden of Department of Horticulture, Dr Panjabrao Deshmukh Krishi Vidyapeeth, Akola, Maharashtra. The experimental plots were laid out in replicated randomized block design (RBD). Eight varieties of pea viz Palam Priya, Palam Smool, Palam Triloki, PB-89, Jawahar Matar-2, Ankur, Arkel and Arka Kartik were grown in the experimental plot. The crop was planted on 20 November 2013 in well prepared beds. Seeds were sown on flat beds measuring 3.15 x 1.20 m row to row and plant to plant distance was

maintained at 35 x 15 cm. First irrigation was applied just after the sowing of seed. Subsequent irrigations were applied at an interval of 7-15 days according to the need of the crop. The crop was fertilized normally and hoed twice manually to keep it free from weeds. The observations were recorded on five competitive plants for pod yield and other qualitative characters.

RESULTS and DISCUSSION

The data on the performance of tested varieties for various qualitative characters and pod yield are given in Table 1.

Number of green pods/plant: All the cultivars except PB-89 (16.43) produced nearly the same number of pods/plant. The cultivar Palam Priya (10.33) and Jawahar Matar-2 (9.83) produced minimum number of green pods/plant. It indicates that priority could be given to a certain cultivars over others on the basis of number of pods/plant if other parameters were also at optimum level.

Green pod weight: The cultivar PB-89 had the maximum green pod weight (4.59 g). The cultivars Palam Smool, Ankur, Arkel and Palam Priya tended to stand at par with Palam Triloki. The poorest performance was shown by the cultivars Arka Kartik and Jawahar matar-2 having only 3.27 g and 4.13 g of green pod weight respectively. This variation might be due to

Table 1. Mean performance of pea varieties with respect to different horticultural traits

Variety	# green pods /plant	Green pod wt (g)	Green pod length (cm)	Green pod yield/plant (g)	Seed yield /plant (g)	Green pod yield/plot (kg)	Green pod yield/ha (q)	Protein content (%)	TSS content (%)
Palam Priya	10.33	4.38	6.86	45.01	30.41	1.87	50.17	21.74	17.34
Palam Smool	13.06	5.18	8.56	59.84	46.3	2.45	64.99	22.39	17.64
Palam Triloki	13.9	5.86	6.2	75.45	63.87	2.91	76.97	23.06	17.67
PB-89	16.43	6.12	10.4	87.93	68.6	3.52	93..21	22.40	17.18
Jawahar Matar-2	9.83	4.13	5.83	51.30	35.1	1.84	48.67	16.32	15.07
Ankur	12.96	5.10	8.93	68.42	53.14	2.44	64.54	20.27	16.75
Arkel	12.43	4.88	8.56	55.07	37.25	2.05	54.31	19.28	17.00
Arka Kartik	11.5	3.27	9.1	41.65	24.34	1.61	42.67	21.08	17.03
SEm±	0.39	0.28	0.95	2.06	1.38	0.09	2.13	0.46	0.11
CD _{0.05}	1.20	0.85	2.89	6.23	4.17	0.25	6.43	1.38	0.32

the inherent potential of cultivars and their interaction with soil and climatic conditions.

Pod length: The PB-89 exhibited maximum pod length (10.4 cm) followed by Arka Kartik (9.1 cm) that was statistically at par with PB-89. The minimum pod length (5.83 cm) was recorded in Jawahar Matar-2. A number of earlier workers have already reported that pea cultivars vary greatly in size and shape of pods and number of seeds per pod (Gentry 1971, Makasheva 1983, Muehlbauer and McPhee 1997).

Green pod yield/plant: Maximum green pod yield/plant was obtained in the cultivars PB-89 (87.93 g), Palam Triloki (75.45 g) and Ankur (68.42 g). All other cultivars behaved statistically alike. Minimum green pod yield/plant was obtained in the cultivars Arka Kartik (41.65 g) and Palam Priya (45.01 g). Both these cultivars also stood at par with each other (Table I). Since green pod yield/ha was calculated on the basis of yield/plant and number of plants/ha therefore it followed the same pattern of significance as the green pod yield/plant. Yield is a complex character determined by the interaction of many heritable characters with soil, climate and agronomic conditions (Makasheva 1983). Maximum yield requires maximum vegetative growth during crop establishment (Muehlbauer and McPhee 1997). In the present study the cultivars PB-89 and Palam Triloki had more number of primary branches/plant and thus

resulted in higher yields. It is however strange that Arka Kartik with more number of primary branches/plant resulted in lower yield which might be due to the different climatic and soil condition requirements of the cultivar.

Seed yield/plant: The cultivar PB-89 gave maximum seed yield/plant (68.6 g) followed by Palam Triloki, Ankur and Palam Smool whereas the cultivar Arka Kartik resulted in the lowest seed yield/plant (24.34 g). This also stood at par with Palam Priya, Jawahar Matar-2 and Arkel. These results show that the cultivar Arka Kartik is a poor variety to produce adequate seed yield/plant.

Qualitative characters: Palam Triloki exhibited the highest protein content of 23.06 per cent. The minimum protein content was recorded in Jawahar Matar-2 (16.32%) followed by Arkel (19.28%). The highest TSS content was found in Palam Triloki cultivar (17.67%) and minimum was in Jawahar Matar-2 (15.07%). Other varieties had TSS content at par with Palam Triloki. These cultivars also behaved statistically alike.

CONCLUSION

This study evaluated the performance of eight varieties of garden pea in semi-arid condition of Vidharba region in terms of number of green pods/plant, green pod weight, green pod length, green

pod yield/plant, green pod yield/plot, seed yield/plot, green pod yield/ha, protein content and TSS content. The results showed that PB-89, Palam Triloki and Ankur differed significantly ($P < 0.05$) in their performance when compared to the other varieties especially Jawahar Matar-2 and Arka Kartik that had the lowest values for all parameters assessed. PB-89, Palam Triloki and Ankur had the highest yields over the others hence they are recommended to farmers in semi-arid condition of Vidharba region for cultivation.

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