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Performance of Different Varieties of Pea (*Pisum Sativum* L.) under Organic Farming Conditions in Mid Himalayas

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Abstract

Garden pea (Pisum sativum L.) is one of the most important vegetable cash crops of Himachal Pradesh. Growing concern towards pesticides' residues due to their indiscriminate use particularly in vegetable crops has attracted worldwide attention towards organic farming. Choice of right types of varieties for growing under organic farming conditions is of utmost importance as all the recommended/ released varieties in present scenario have been developed and evaluated under inorganic farming conditions and it has been often observed that the high input responsive varieties fail to perform better under low input organic farming conditions. Keeping in view the potential of organic farming in India, there is an urgent need to identify the potential genotypes/varieties responsive to low input conditions of organic farming. Trials for evaluation of different varieties of garden pea were conducted consecutively for two years (2011-12 and 2012-13) at Model Organic Farm, CSKHPKV, Palampur for identifying suitable varieties responsive to organic farming system. Fifty five genotypes of pea including three check varieties viz., Palam Priya, Palam Smool and Punjab-89 were evaluated in Augmented block design with five replicates of check varieties. The seeds were sown at 45 × 10 cm spacing during second week of November consecutively for two years. Out of 55 genotypes/varieties of garden pea screened during Rabi 2011-12 & 2012-13 for higher productivity under organic farming conditions, EC538008 was recorded the highest yielding (108.58 q/ha) and was statistically at par with Kukumseri-6(101.61 q/ha), IC 267732(101.07 q/ha), DPPM-74 (92.84 q/ha) and DPP-54(91.96 q/ha). It was also statistically at par with two standard checks viz., Palam Priya (85.24) and Punjab-89 (91.12 q/ha)

Keywords: Pea (Pisum sativum L.), varietal evaluation, organic farming.

1. Introduction

Garden pea (*Pisum sativum* L.) is one of the most important vegetable cash crops of Himachal Pradesh covering the maximum area of 21,700 hectare with production of 2,37,300MT (Anonymous, 2009-10). It occupies 27% of the total area under vegetable cultivation in the state. Growing concern towards pesticides' residues due to their indiscriminate use particularly in vegetable crops has attracted worldwide attention towards organic farming. In India, organic farming is one of the fast growing sector as the net area under organic farming has increased from 42,000 ha in 2003-04 to 1,61,930 ha in 2008-09 (IFOAM survey, 2011). About 585,970 tonnes of organic products worth Rs. 301 million were exported from India (Ramesh et al. 2010). The varieties of all the vegetable crops so far recommended for commercial cultivation have been developed and evaluated under high input inorganic farming conditions. Such varieties may not perform better under low input organic farming conditions. Keeping in view the potential of organic farming in India, there is an urgent need to identify the potential genotypes/varieties responsive to low input conditions of organic farming.

2. Materials and Methods

The experiments to identify potential varieties suitable for growing under organic conditions under mid hill zone of Himachal Pradesh. In this context, fifty five genotypes/ varieties of garden pea including three check varieties *viz.*, Palam Priya, Palam Smool and Punjab-89 were evaluated in Augmented block design with five replicates of check varieties. during 2011-12 and 2012-13 at certified Model Organic Farm, Department of Organic Agriculture of CSKHPKV, Palampur. The crop was grown using all the organic inputs at a spacing of 45 × 10 cm during second week of November each year. The observations were recorded on ten competitive plants for pod yield and other ancillary characters.

3. Results and Discussion

Significant differences among the different genotypes were observed for all the traits studied (Table 1). It is apparent from the table that different horticultural traits varied from 35.67 (DPP-54) to 66.17% (DPPMWR) in 2011-12 and 24.64(FC-2) to 57.08%(IC296678) in 2012-13 for pod shelling percentage, 2.68 (FC-2) to 15.45 (EC538008) in 2011-12 and 3.47 (Mr. Big) to 12.27 (EC 538008) in 2012-13 for pods per plant, 14.6 (KMMR-89) to 55.72g (IC267732) in 2011-12 and 5.21 (KMMR-89) to 52.13g (EC538008) in 2012-13 for pod yield per plant and 32.41 (KMMR-89) to 123.69 q(IC267732) in 2011-12, 26.33 (Lincoln) to 112.36q (EC538008) in 2012-13

and 22.04 (KMMR-896) to 108.58 q/ha (EC538008)for pod yield (q/ha). The highest pod yield per hectare was observed in EC538008 (108.58 q/ha), however, it was statistically at par with Kukumseri-6(101.61 q/ha), IC 267732(101.07 q/ha), DPPM-74 (92.84 q/ha) and DPP-54(91.96 q/ha). It was also statistically at par with two standard checks viz., Palam Priya (85.24) and Punjab-89 (91.12 q/ha). The findings are in accordance with Kader *et al.* 1982 and Chadha *et al*. 2010)

Table 1: Evaluation of different varieties of pea under organic farming conditions.

Sr. No.	**Varieties**	**Shelling percentage(%)**		**Pods per plant**		**Pod yield/plant (g)**		**Pod yield(q/ha)**		
		2011-12	**2012-13**	**2011-12**	**2012-13**	**2011-12**	**2012-13**	**2011-12**	**2012-13**	**Pooled**
1.	Palam Priya	50.22	50.79	8.49	7.90	42.53	34.57	94.43	93.55	85.24
2.	DPPM-64	50.93	44.16	5.44	4.76	32.68	24.84	72.56	70.66	63.61
3.	PB 89	49.43	53.48	7.50	8.14	46.71	35.69	103.71	98.32	91.12
4.	Arka Ajit	50.61	55.41	4.56	4.23	25.61	12.29	56.86	44.42	42.12
5.	FP-108	47.78	63.56	6.56	5.13	20.95	8.56	46.51	36.13	32.80
6.	DPPM-72	59.79	49.36	7.64	6.43	16.81	24.23	37.32	70.93	45.61
7.	KMMR-896	45.67	72.42	4.23	4.63	14.60	5.21	32.41	28.70	22.04
8.	DPP-13	52.72	56.78	10.36	8.13	46.66	25.01	103.59	72.66	79.61
9.	DPEPP-1	47.00	66.80	3.16	4.43	23.44	18.82	52.04	58.92	46.96
10.	JP Azillia	50.79	53.28	10.13	7.43	30.30	12.64	67.27	45.20	47.72
11.	DPPM-1	37.75	60.39	6.79	5.73	22.07	19.84	49.00	61.17	46.57
12.	DPPMFWR-8	46.42	73.73	6.73	5.43	28.47	17.96	63.21	57.00	51.59
13.	VMR-49	42.84	54.58	5.03	4.83	19.29	7.89	42.83	34.64	30.22
14.	Acacia	43.91	33.29	5.43	4.87	34.65	22.18	76.93	36.46	63.00
15.	DPP-107	42.86	32.51	5.01	5.27	31.17	25.18	69.20	43.12	62.47
16.	DPP-80	45.42	42.12	8.93	6.97	40.62	28.10	90.18	49.60	76.20
17.	FC-2	43.10	24.64	2.68	4.07	20.69	19.98	45.94	31.58	45.07
18.	DPPM-73-2	40.10	29.01	8.46	7.37	36.89	32.99	81.90	60.45	77.48
19.	Arka Karthik	39.12	44.07	3.43	4.07	26.82	17.74	59.55	26.60	49.38
20.	KPMR-523	44.84	38.51	5.53	5.87	28.99	26.12	64.36	45.20	61.09
21.	Kukumseri-6	50.38	26.08	9.18	8.57	50.78	40.83	112.74	77.86	101.61
22.	DPP-54	35.67	45.86	11.83	9.57	48.39	34.53	107.43	63.87	91.96
23.	DPPM-65	44.23	42.10	6.86	7.07	27.24	38.07	60.48	71.72	72.41

24.	CHPM-2	48.07	52.33	4.01	4.47	21.25	15.25	47.18	37.64	40.56
25.	EC-292166	52.61	56.20	6.63	6.47	17.63	18.08	39.14	43.92	39.68
26.	P-212-B	48.09	59.22	8.36	7.47	22.50	20.77	49.95	49.90	48.08
27.	KDMR-675	56.57	53.17	10.11	9.27	28.65	34.60	63.60	80.59	70.25
28.	DPP-62	56.96	59.87	6.86	7.07	19.43	11.34	43.14	28.96	34.20
29.	JC-243389	56.24	52.56	7.15	6.47	19.06	15.68	42.32	38.59	38.61
30.	DPPMR-09-9	58.12	69.06	7.76	7.87	18.39	25.35	40.83	60.05	48.59
31.	P-96	60.36	58.09	8.71	8.57	24.65	25.22	54.72	59.77	55.40
32.	EC-499761	54.47	55.51	9.20	8.47	25.32	19.27	56.21	46.55	49.53
33.	DPP-3	57.98	63.61	7.36	7.47	21.85	20.17	48.51	48.56	46.69
34.	IPFP-2-6	46.48	51.84	5.97	5.77	19.50	18.06	43.29	36.71	41.67
35.	EC-538008	65.82	56.27	15.45	12.27	45.70	52.13	101.45	112.36	108.58
36.	DPPMWR-20	55.84	55.28	7.80	7.27	23.81	23.91	52.85	49.70	52.95
37.	DPP-94	60.66	50.40	8.27	6.97	24.63	30.55	54.68	64.44	61.23
38.	EC-381866	57.90	52.65	5.32	5.07	16.21	18.81	35.98	38.39	38.86
39.	DPPMFWR-27	64.02	55.40	9.53	7.87	28.23	32.68	62.67	69.18	67.60
40.	DPPMWR-132	66.17	58.02	5.42	5.27	17.11	21.19	37.98	43.67	42.50
41.	IC267732	46.50	49.45	14.03	10.57	55.72	35.35	123.69	75.10	101.07
42.	Lincon	46.21	56.60	5.50	5.77	28.18	13.38	62.56	26.33	46.12
43.	DPP-137	44.58	54.42	7.77	6.27	29.48	22.16	65.44	45.81	57.30
44.	Azad Pea	54.68	52.50	5.95	5.87	28.04	28.33	62.25	59.52	62.56
45.	DPPMR09-1	48.22	56.37	9.87	6.17	40.85	27.60	90.69	56.51	75.98
46.	DPPMFWR-4	47.28	53.83	6.59	4.87	22.46	30.39	49.87	62.71	58.67
47.	IC-242164	43.24	59.09	8.82	5.97	20.99	19.21	46.60	37.89	44.63
48.	DPP-11-2	43.02	52.06	5.37	4.17	23.63	21.18	52.46	42.26	49.74
49.	DPP-127-R	48.31	50.29	8.05	5.47	24.68	18.60	54.79	36.53	48.04
50.	916029-5	41.13	60.52	8.80	5.77	33.47	15.04	74.31	28.61	53.84
51.	Mr.Big	40.31	47.53	4.40	3.47	26.52	34.77	58.88	72.42	68.03
52.	Arka Sampurna	47.11	48.11	6.36	4.87	29.76	25.10	66.07	50.96	60.90
53.	DPPM-74	53.70	52.00	11.44	7.77	47.90	35.74	106.34	74.57	92.84
54.	VRPMR-9	47.42	48.15	7.57	5.17	26.06	28.77	57.86	59.10	60.86
55.	IC-296678	46.16	57.08	12.19	7.57	28.51	30.49	63.30	62.92	65.49
Critical Differences at 5 % (Between)										

Two Control Treatments	7.39	5.55	2.21	0.77	8.59	6.33	19.07	15.53	15.11
Two Test Treatments(Different Blocks)	17.26	12.92	5.13	1.78	19.84	14.58	43.87	35.67	47.79
A Test Treatment and A Control Treatment	13.18	9.88	3.92	1.36	15.20	11.18	33.66	27.39	33.79

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