

Performance of Field Pea (*Pisum sativum* L.) as affected by Phosphorus Application

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Abstract

A field experiment was conducted at Agriculture Research Farm of Raja Balwant Singh College, Bichpuri, Agra during rabi season of 2015-16 for evaluation of performance of KVR-7, Adarsh and Prakash varieties of field pea with respect of application of zero, 30; 60 and 90 kg P_2O_5 /ha. Data revealed that Prakash variety proved better than others regarding dry weight per plant, number of pods per plant, weight of pods per plant, pod length, number of seeds per plant, test weight per plant, seed and stover production. A dose of 90 kg P_2O_5 /ha resulted maximum potential of field pea yields.

Key words: Field pea varieties, phosphorus application yield parameters.

Introduction

Pea is one of the best known grain legumes in temperate climate because of its universal popularity as a fresh vegetable. The growth and final yield of pea are dependent on the better strain and nutrient application under normal soil and climate conditions. Despite of all cultural practices the proper availability of

phosphorus improves yield and quality of legumes such as pea. The information on phosphorus requirement of pulses especially on peas is quite meagre. Therefore phosphorus requirement in relation of pea cultivars will certainly help the farmers to improve their earnings.

Material and Methods

A field experiment was conducted on Agriculture Research Farm, Raja Balwant Singh College, Bichpuri, Agra during rabi season of 2015-16. The experiment soil had sandy loam texture, available phosphorus 25.30 kg P_2O_5 /ha, and available potash 285.0 kg K_2O /ha. The experimental treatments were four pea

varieties as P-13(V_1), KNR-7 (V_2), Adarsh (V_3) and Prakash (V_4) and four levels of phosphorus as Zero (control- P_0), 30 (P_1), 60 (P_2) and 90 (P_3) kg P_2O_5 /ha. Treatments were replicated four times in factorial RBD. Experimental data for yield attributes and yield were recorded and analysed statistically.

Result and Discussion

The data presented in table 1 indicate that yield attributes such as dry weight per plant, number of pods per plant, weight of pods per plant, pod length, number of seeds per pod, weight of seeds

per pod and test weight were influenced significantly with different varieties. The highest values of these characters were recorded with variety Prakash (V_4) followed by KNR-7 (V_2).

Similar results were reported earlier also [1, 5]. These yield attributes increased significantly upto 90 kg P₂O₅/ha application the improvement in these characters was due to higher

photosynthetic activity and translocation of photo syntheses to sink with phosphorus application which resulted better yields as also observed by many investigators in the past [6, 7].

Table 1 Yield attributes as influenced by different varieties and Phosphorus levels

Treatment	Dry weight Plant ¹ (g)	Number of pods plant ¹	Weight of pods plant ¹ (g)	Pods length(cm)	Number of seeds pod ⁻¹	Weight of seeds pod ⁻¹	Test weight(g)
P-13 (V ₁)	12.25	9.68	12.37	7.02	4.42	0.93	213.98
KNR-7 (V ₂)	13.42	10.37	17.68	7.62	5.82	1.28	220.48
Adrash (V ₃)	11.08	8.72	8.75	6.57	3.45	0.78	210.86
Prakash (V ₄)	14.85	11.30	19.78	8.56	5.82	1.32	222.75
S.Em±	0.72	0.42	1.03	1.54	0.42	0.09	1.76
C.D.at 5%	1.47	0.87	2.12	NS	0.87	NS	3.62
Phosphorus Levels							
0(control)	11.23	8.75	9.25	6.20	3.75	0.75	209.00
30	12.30	9.78	13.20	7.00	4.65	1.02	216.84
60	13.42	10.30	16.25	7.65	5.38	1.81	220.72
90	16.57	10.78	18.10	8.73	5.80	1.31	222.48
S.Em±	0.71	0.42	1.02	1.56	0.41	0.09	1.76
C.D.at 5%	1.44	0.87	2.08	NS	0.87	NS	3.62

It is evident from table 2 that biological, seed and stover yield increased significantly with Prakash (V₄). Variety KNR-7 (V₂) also found significantly superior than Adarsh (V₃) and P-13 (V₁) in respect to biological, seed and stover yield. These findings confirm the results of many others [5]. The favourable response of grain yield to phosphorus of each variety might

be attributed to the important role of this element in mobilization of nutrients and protein synthesis [2, 3, 4].

Increasing doses of phosphorus upto 90 (P₃) kg P₂O₅/ha increased shelling percentage and harvest index. This may be attributed to increased number of seeds per pod.

Table 2 Yield (q/ha) as influenced by different varieties and phosphorus levels.

Treatment	Biological yield (qha ⁻¹)	Seed Yield (qha ⁻¹)	Stover yield (qha ⁻¹)	Shelling (%)	Harvest Index (%)
P-13(V ₁)	39.48	13.18	26.32	75.00	32.85
KNR-7 (V ₂)	43.45	14.45	29.00	76.02	33.10
Adrash (V ₃)	36.30	11.85	24.55	73.75	32.72
Prakesh (V ₄)	44.54	14.80	29.74	76.70	33.20
S.Em ±	0.89	0.70	1.03	0.74	0.09
C.D. at 5%	1.82	1.42	2.10	1.51	0.19
Phosphorus levels					
0 (Control)	36.72	11.92	25.80	72.15	32.42
30	40.82	13.20	27.62	74.25	32.78
60	43.45	14.35	29.10	76.38	33.45
90	44.50	14.45	30.05	77.58	33.52
S.Em±	0.88	0.71	1.03	0.73	0.09
C.D. at 5%	1.80	1.44	2.10	1.48	0.19

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