

Evaluation of Genotypes for Yield and its Contributing Traits in Garden Pea (*Pisum sativum* L.)

ABSTRACT

The present experiment was carried out to find out the diversity among different genotypes with the use of 44 diverse genotypes for quantitative traits and qualitative traits. The study was conducted with the field evaluation of 44 genotypes during 2019-20. There were wide range of variations observed among the traits during 2019-20. The observation viz. Days to 50 per cent flowering, primary branches per plant, node to first flower appears, node to first pod appears, length of pod (cm), pod diameter (cm), number of seed per pod, number of pods per plant, number of pod per 250g, number of seed per 250g, weight of seed per 250g, shelling(%), T.S.S.(°B), pod yield per plant and two visual observation were pod shape and pod colour were recorded. Perusal of *per se* performance of the genotypes for all the traits studied revealed a wide range of mean values which indicated that the genotypes involved in this study were genetically diverse and have good breeding value, which confirmed the predictions of analysis of variance. Out of 44 genotypes, eighteen genotypes produced significantly higher yield than best check PC-52.

Comment [kA1]: No need to mention all the recorded traits in abstract they would be mentioned in material and methods

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Keywords: [Garden Pea, Mean perform, Diversity, Yield]

1. INTRODUCTION

Garden Pea (*Pisum sativum* L. var. *hortense*) belongs to family Leguminaceae sub family Fabaceae and is an important legume vegetable grown throughout world during cool season. It is a self pollinated crop having diploid chromosome number $2n=14$. It is most extensively cultivated in the temperate regions and restricted to cooler altitudes in the tropics and winter season in the sub tropics. It is highly nutritious and capable of using atmospheric nitrogen. Fresh pod of garden pea is highly nutritive containing high percentage of digestible protein along with carbohydrate, vitamins and minerals (Chaudhary, 1996). Large proportion of garden pea are processed (canned, frozen and dehydrated and pickle) for consumption. It is mostly consumed as green and fresh grains. The total area covered by peas is 563 million hectare with the production of 5703 metric tonnes whereas, productivity is 10.12 metric tonnes per hectare (Anonymous, 2021). The major pea growing states in India are Uttar Pradesh, Bihar, Madhya Pradesh and Maharashtra. Uttar Pradesh is the leading producer of pea contributing alone about 50% of its production and area. It is also grown as a summer season crop in hilly areas.

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2. MATERIALS AND METHODS

The present investigation entitled “**Evaluation of genotypes for yield and its contributing traits in Garden pea (*Pisum sativum* L.)**” was carried out at Main Experiment Station (Vegetable Research Farm), Acharya Narendra Nagar (Kumarganj), Ayodhya, U.P., India, during Rabi season of 2019-20. The experimental materials for the present investigation was comprised of 44 different genotype (42 genotype + 2 check) of garden pea selected on the basis of genetic variability from the germplasm stock maintained in the Department of Vegetable Science, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya, U.P., India. These 44 genotypes were evaluated for the study of evaluation genotypes. The experiment laid out in Randomized Block Design with three replication and 44 treatments including two check. The observations viz. Days required for 50 per cent flowering, primary branches per plant, node to first flower appears, node to first pod appears, length of pod (cm), pod diameter (cm), number of seed per pod, number of pod per plant, number of pod per

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250g, number of seed per 250g, weight of seed per 250g, shelling(%), T.S.S.^{(0)B}, pod yield per plant, pod shape and pod colour were recorded.

Comment [kA7]: Mention the statistical approach followed for evaluation

3. RESULTS AND DISCUSSION

Perusal of *per se* performance of the genotypes for all the traits studied revealed a wide range of mean values which indicated that the genotypes involved in this study were genetically diverse and have good breeding value, which confirmed the predictions of analysis of variance. Among the genotypes, NDVP-132 was the earliest line with respect to days to 50% followed by NDVP-158; highest number of primary branches per plant 6.12 (NDVP-128); Node to first flower appears 8.66 (NDVP-127) ; Node to first pod appears 7.53 (NDVP-123); Length of Pod 10.37 cm(PC-521); Width of Pod (cm) 1.70 (NDVP-141); of Seeds per pod 8.20 seeds (NDVP-163); Number of Pods per plant 39.20 (NDVP-161); Number of Pods per plant 68.00 (NDVP-169); Number of seeds per 250 476.00 (NDVP-171); Weight of seeds per 250 160.00 (NDVP-127.00); shelling per cent 56.00%(NDVP-136); maximum T. S.S. 17.66 (NDVP-160) and maximum yield per plant 199.26 g(NDVP-168) during 2019-20. Among 44 genotype pod shape of thirty three genotype were curve shape, nine straight shape and two slightly curve shape. The pod color among 44 genotype, twenty four genotype were light green and twenty dark green. Out of 44 genotypes, eighteen genotypes produced significantly higher yield than best check PC-521 (Table-1). The present study corroborated with the findings of Srivastava *et al.* (2009) and Dar *et al.* (2013), Ghobary (2010) and Singh *et al.* (2011).

Table.1 : Mean performance of genotypes in relation to different growth and yield traits of garden pea.

Genotypes	Days to 50% Flowering	Primary branches per plant	Node to first flower appears	Node to first pod appears	Length of pod (cm)	Width of pod (cm)	Number of seed per pod	Number of pod per plant	Number of pod per 250 gm	Number of seed per 250 gm	Weight of seed per 250gm	Shelling %	T.S.S. ^{(0)B}	Pod yield per plant
NDVP-121	43.66	3.86	9.86	10.06	8.87	1.35	7.40	26.66	45.00	347.66	153.33	50.33	11.83	156.20
NDVP-122	41.54	5.06	10.70	10.76	8.17	1.33	5.26	32.40	46.66	245.40	105.76	40.93	11.43	101.44
NDVP-123	43.76	3.53	9.86	9.26	8.17	1.39	5.66	21.63	45.00	270.70	146.66	52.00	11.00	115.87
NDVP-124	51.39	4.46	9.80	9.80	9.71	1.25	6.93	22.13	46.66	286.00	145.00	50.66	11.06	118.66
NDVP-125	46.95	3.40	9.46	10.06	9.20	1.56	5.33	15.80	37.33	221.66	113.33	45.33	12.66	111.73
NDVP-126	42.96	3.13	9.13	9.20	9.28	1.30	6.60	21.46	44.00	271.66	126.66	50.66	10.43	124.26
NDVP-127	42.66	3.53	8.66	8.73	8.03	1.39	6.86	18.26	46.00	310.66	160.00	54.00	10.73	112.26
NDVP-128	41.88	6.12	10.56	10.43	8.53	1.43	7.73	33.26	50.33	379.66	120.83	48.16	13.03	130.33
NDVP-129	41.54	3.50	9.46	10.13	8.25	1.38	5.93	20.20	46.00	250.66	133.33	53.33	14.26	115.33
NDVP-130	61.10	4.73	9.33	7.53	9.34	1.35	6.80	19.70	51.33	300.00	133.33	53.33	14.03	112.73
NDVP-131	42.07	4.60	9.26	9.26	9.90	1.29	7.06	25.87	43.33	264.00	145.00	51.33	14.30	133.82
NDVP-132	41.40	4.00	10.60	10.60	9.30	1.34	6.80	30.20	44.66	312.33	153.33	54.66	10.66	158.82
NDVP-133	44.81	3.96	12.26	12.40	8.68	1.42	6.00	24.50	48.00	256.33	140.00	51.33	14.13	172.54

NDVP-134	44.54	1.79	11.80	12.46	7.29	1.36	6.40	18.73	48.00	286.00	115.00	41.33	10.70	102.96
NDVP-135	44.41	2.40	9.86	10.40	8.06	1.40	6.80	33.71	43.00	280.00	140.00	50.66	13.16	178.66
NDVP-136	44.69	3.10	9.46	9.53	8.45	1.30	6.26	18.20	44.66	276.33	140.00	56.00	10.66	101.40
NDVP-137	47.07	3.83	12.80	13.80	9.65	1.55	6.20	22.33	49.33	287.00	133.33	53.33	10.60	111.13
NDVP-138	42.93	2.93	12.93	13.26	10.04	1.46	7.60	21.86	49.00	379.00	146.66	52.66	11.56	119.00
NDVP-139	43.88	3.83	12.40	12.93	9.54	1.42	7.73	20.36	66.33	374.33	146.66	51.33	12.50	92.86
NDVP-140	44.85	4.13	12.66	12.93	7.28	1.68	6.20	38.73	52.33	321.66	120.00	48.00	11.50	187.06
NDVP-141	42.97	2.86	14.66	14.66	8.41	1.70	7.20	22.00	43.00	313.33	143.33	52.66	13.93	178.60
VRP-6 (C)	43.85	2.16	10.06	10.20	8.74	1.38	7.13	23.50	45.66	297.00	126.66	50.66	12.73	115.06
NDVP-151	53.45	3.00	13.80	13.86	9.30	1.49	6.53	31.06	43.66	300.00	146.66	50.66	12.46	163.93
NDVP-152	52.77	2.26	12.20	12.46	9.56	1.32	8.20	27.06	60.00	376.66	156.66	52.66	13.26	119.66
NDVP-153	45.31	4.05	13.40	13.60	9.78	1.43	7.93	36.93	48.66	369.33	143.33	50.66	11.63	193.06
NDVP-154	51.86	2.86	12.00	13.06	9.81	1.20	7.66	26.50	62.00	456.66	153.33	53.33	12.66	95.13
NDVP-155	49.06	2.33	11.60	12.40	9.58	1.16	7.33	36.30	56.33	421.33	153.33	52.66	11.23	151.13
NDVP-156	59.15	2.13	13.53	13.53	10.16	1.18	6.73	35.73	51.33	341.66	146.66	52.66	12.36	171.20
NDVP-157	53.05	1.83	12.93	13.53	9.81	1.14	7.93	25.86	57.33	464.33	153.33	52.00	13.30	109.46
NDVP-158	63.77	3.03	12.46	13.53	9.36	1.28	7.40	34.60	46.66	344.33	146.66	52.66	12.16	190.80
NDVP-159	55.42	2.90	14.06	14.20	10.19	1.36	7.80	35.60	46.00	342.00	133.33	53.33	15.30	198.86
NDVP-160	66.30	1.53	12.13	12.13	9.82	1.53	7.93	31.40	45.00	359.33	140.00	52.00	17.66	171.80
NDVP-161	60.63	3.86	13.46	15.00	10.16	1.01	7.66	39.20	61.33	443.33	136.66	50.66	12.00	160.60
NDVP-162	52.41	2.96	14.20	13.86	8.38	1.23	7.33	31.20	52.33	405.00	126.66	50.66	14.93	141.80
NDVP-163	56.54	2.73	10.60	13.00	9.97	1.10	8.20	26.06	51.66	431.66	150.00	52.66	14.13	126.20
NDVP-164	60.71	1.90	13.13	13.13	9.69	1.12	7.26	17.06	61.66	443.33	130.00	50.66	16.16	69.00
NDVP-165	67.02	1.80	11.40	11.40	7.80	1.28	6.53	27.66	67.66	425.00	140.00	52.00	12.50	95.13
NDVP-166	67.36	2.90	15.53	14.80	8.07	1.28	6.73	39.20	59.33	405.00	133.33	53.33	13.66	196.40
NDVP-167	63.23	1.86	18.40	18.53	7.55	1.19	7.20	38.93	74.00	474.33	136.66	54.66	11.06	146.93
NDVP-168	61.27	4.03	16.73	16.86	8.88	1.61	6.46	34.60	41.66	259.33	133.33	53.33	12.23	199.26
NDVP-169	52.89	2.53	12.53	12.86	9.22	1.10	6.20	31.73	68.00	406.66	126.66	46.66	14.06	116.13
NDVP-170	53.32	2.26	15.06	15.06	8.43	1.22	6.46	34.26	61.00	359.33	130.00	50.00	12.23	134.93
NDVP-171	54.95	2.86	14.60	14.60	9.56	1.16	7.66	25.10	64.00	476.00	143.33	52.66	12.33	98.01
PC-521 (C)	57.27	2.86	12.53	14.33	10.37	1.14	7.26	30.26	50.66	422.00	146.66	52.00	9.50	139.00
SE(d)	1.51	0.16	0.69	0.69	0.28	0.04	0.37	1.25	1.94	10.44	6.58	1.73	0.28	4.61
CV	5.13	8.85	9.96	9.76	5.37	6.21	9.30	7.77	6.52	5.21	8.23	5.88	3.87	5.82
CD @ 1 %	5.63	0.60	2.59	2.59	1.04	0.17	1.39	4.66	7.22	38.92	24.53	6.48	1.04	17.20

CD @ 5 %	4.25	0.45	1.95	1.96	0.78	0.13	1.05	3.52	5.45	29.37	18.51	4.89	0.79	12.98
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*,** Significant at 5% & 1% respectively

4. CONCLUSION

The conclusion for Daysto 50 per cent flowering, primary branches per plant, node to first flower appears, node to first pod appears, length of pod (cm), pod diameter (cm), , number of seed per pod, number of pod per plant, number of pod per 250g, number of seed per 250g, weight of seed per 250g, shelling(%), T.S.S.(^oB), pod yield per plant and two visual observation were pod shape and pod colour were recorded. Perusal of *per se* performance of the genotypes for all the traits studied revealed a wide range of mean values which indicated that the genotypes involved in this study were genetically diverse and have good breeding value, which confirmed the predictions of analysis of variance. Out of 44 genotypes, eighteen genotypes produced significantly higher yield than best check PC-52.

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