

Growth Performance of Garden Pea (*Pisum sativum*) Varieties Grown under Open Field Condition

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ABSTRACT

Fifteen varieties of pea (*Pisum sativum*) were evaluated under open field condition for their growth attributes during *rabi* 2019-20 and 2020-21 for two consecutive years. The research was carried out at Department of Horticulture, College of Agriculture, UAS, GKVK, Bengaluru by adopting randomized complete block design with three replications. The study taken up on growth attributes in different varieties revealed significant differences registered in all traits. Pooled data of two consecutive years revealed that the variety Arka Karthik registered the highest plant height (86.11 cm), number of branches per plant (14.88), internodal length (7.41 cm) and number of leaves per plant (53.66), at 90 days of sowing where as the minimum plant height (55.10 cm), number of branches per plant (6.60), number of leaves per plant (31.87) internodal length (4.78 cm), was associated with Magadi local. Whereas, maximum leaf chlorophyll content (58.38), relative water content (48.02 %) and leaf area (936.05 cm²) at 90 days of sowing were observed with Arka Apoorva and minimum relative water content (31.07), total leaf chlorophyll content (39.96) and leaf area (517.86 cm²) were noticed in the variety Magadi local.

Keywords : Garden pea, Varieties, Growth, Open field condition

GARDEN PEA (*Pisum sativum* L.) ($2n=2x=14$) is one of the most important leguminous vegetable. Throughout the world, this vegetable is grown for its delicious, nutritious seeds. It belongs to the family Fabaceae and the sub family Papilionaceae. Peas are grown in India primarily as a winter vegetable crop in the plains and as a summer vegetable crop at higher elevations. It thrives well in cool environment and can withstand relatively low temperatures, especially during the seedling stage. In India, major pea producing states are Uttar Pradesh, Bihar, Haryana, Punjab, Himachal Pradesh, Orissa and Karnataka. India is ranked second, next to China both in terms of area and production. In the country total area and production of Garden Peas in 2017-18 was 540,000 ha and 5422.01 mt/ha, respectively, which was the 21 per cent production of world. The productivity of peas is about 12.66 t/ha which has shown to decrease in last three to four years. (NHB, 2018).

Green peas are highly nutritive and rich source of digestible protein (7.2%), carbohydrate (15.77%), minerals and vitamins. Being a rich source of protein

(27%), it occupies an important place in vegetarian diet. It is an important off season cash crop vegetable in Uttar Pradesh (Singh *et al.*, 2015). Large production of peas is processed, canned, frozen or dehydrated for consumption during off-season. Being a leguminous crop, it also enriches the soil by fixing the atmospheric nitrogen into the soil. The protein of peas contains all the essential amino acids required for the normal activity of living organisms.

The characteristics of a cultivar, as well as the combination of traits, vary depending on the climatic conditions of the localities. Before recommending any variety suitable for the region, it is necessary to evaluate genotypes with a focus on genotypic suitability and yield. Considering the importance of the crop and the current status of garden pea performance, this study was conducted.

MATERIAL AND METHODS

The present investigation, comprising 15 varieties of garden peas was carried during 2019-20 and 2020-21 from October to January at the Horticulture Research

station, Department of Horticulture, College of Agriculture, UAS, GKVK, Bengaluru. The treatments, which included fifteen genotypes of garden peas, as well as their sources of collection, are enlisted in Table 1. Seeds were collected from the source during both consecutive years. The experiment was conducted using Randomized Complete Block Design (RCBD) with three replications in open field conditions following 30 cm x 10 cm spacing with the individual gross plot size was (2.1 m x 0.9 m).

TABLE 1
Lists of Garden pea varieties along with sources of procurement

Treatment	Variety	Source
1	Kashi Mukti	IIVR, Varanasi
2	Kashi Ageti	IIVR, Varanasi
3	Kashi Nandhini	IIVR, Varanasi
4	Kashi Uday	G. B. Pant University of Agriculture and Technology
5	PSM-2	G. B. Pant University of Agriculture and Technology
6	PSM-3	G. B. Pant University of Agriculture and Technology
7	PSM-4	G. B. Pant University of Agriculture and Technology
8	PSM-6	G. B. Pant University of Agriculture and Technology
9	Arka Karthik	IIHR, Bengaluru
10	Arka Apoorva	IIHR, Bengaluru
11	Arka Uttam	IIVR, Varanasi
12	Kashi Samriddhi	IIVR, Varanasi
13	Kashi Shakti	IIVR, Varanasi
14	Pant Uphar	G. B. Pant University of Agriculture and Technology
15	Magadi Local	Local Variety

The required area for experiment was marked prior to layout at horticulture research station department of horticulture for both the consecutive years of 2019-20 and 2020-21 and the experimental plot was ploughed with tractor followed by leveling, double disking and planking with a view to have a fine tilth of the experimental plot. Weeds and traces were removed so as to obtain clean and leveled deep bed and fine texture.

The following doses of Vermicompost and fertilizers were applied at the time of field preparation. Accordingly 10 tones of FYM, 12.5 kg Nitrogen, 75 kg phosphorus and 50 kg of potash per hectare were applied at the time of land preparation of experimental plots and 12.5 kg nitrogen per hectare were applied at 30 days after sowing. Irrigation was provided as and when necessary seeds were collected separately from the source during both consecutive years of 2019-20 and 2020-21. Seeds were sown to a depth of 4 to 5 cm by dibbling method as per recommended plant placing. Standard agronomic practices and plant protection measures were adopted as per schedule. Five plants from each plot were randomly chosen and tagged in order to record observations.

The observations on various growth parameters of Plant height, number of branches, were recorded at different growth stages of 30, 60, 90 days after sowing and number of leaves, internodal length and leaf area were recorded and the replicated mean data was subjected to statistical analysis for interpretation applying the Randomize complete Block Design and the significance was tested as (Panse and Sukhatme, 1957) 'F' test critical difference for examining treatments means for their significance was calculated at five per cent level of significance.

Relative Water Content

Select the plant which is healthy and upper most fully open leaves and cut the leaves of known area either square or circle take the fresh weight immediately and then keep it in petridish containing de ionized water for five hours under low irradiance for full absorption of moisture then take the leaf outside from petridish and remove the water content with the help of blotting paper prior to determining turgid weight. Finally record the dry weight of leaf after oven drying at 60 °C for 48 h (or until they read constant weight). The relative water content was calculated using the formula :

$$\text{Relative water content} = \frac{\text{Fresh weight} - \text{dry weight}}{\text{Turgid weight} - \text{dry weight}} \times 100$$

Chlorophyll Content

Chlorophyll content was measured by using Chlorophyll Meter SPAD-502, the data collected on ten randomly selected plants on young leaves and reading was taken and average was worked out. The third fully opened leaf from the apex used for the SCMR determination during flowering stage. Put fully expanded leaf into it in such a way that only a mid rib remains inside average of readings was noted automatically. The basic working principle of this device for measuring chlorophyll is the value measured by the Chlorophyll Meter SPAD 502 corresponds to the amount of chlorophyll present in the plant leaf.

Leaf Area (cm²)

Leaf area is an important agronomical parameter as it related to plant growth photosynthetic capacity and

used to assess the effect of different plant treatment were recorded at maturity stage 90 DAS. Leaf area meters are scientific instrument that are specially designed to measure the area. The leaf is placed between a light source and a photocell, the reduction in photocell output due to the presence of the leaf gives a measure of leaf area.

RESULTS AND DISCUSSION

Days Taken for Germination

Data pertaining to days taken for germination recorded from different treatments recorded from the experimental field are presented in Table 2. Significant differences were observed between the genotypes for days taken for germination during 2019-20 and 2020-21 as well as for pooled average. From the two consecutive years pooled average Magadi Local recorded significantly taken more number of days for

TABLE 2
Days taken for germination and Germination percentage by different Varieties of garden pea grown under Open Field condition

Treatment	Varieties	Days taken for germination			Germination percentage		
		During 2019	During 2020	Pooled data	During 2019	During 2020	Pooled data
T ₁	Kashi Mukti	6.00	5.67	5.84	94.00	92.67	93.34
T ₂	Kashi Ageti	7.00	6.00	6.50	85.85	94.00	89.93
T ₃	Kashi Nandini	5.00	5.00	5.00	90.95	90.82	90.89
T ₄	Kashi Uday	5.67	6.00	5.84	96.33	92.98	94.66
T ₅	PSM-2	6.00	7.00	6.50	93.33	92.47	92.90
T ₆	PSM-3	6.00	7.00	6.50	91.74	92.34	92.04
T ₇	PSM-4	5.33	7.00	6.17	95.67	92.00	93.84
T ₈	PSM-6	6.00	7.00	6.50	93.57	91.45	92.51
T ₉	Arka Karthik	8.33	9.00	8.67	95.67	92.00	93.84
T ₁₀	Arka Apoorva	9.00	8.67	8.84	93.84	92.50	93.17
T ₁₁	Arka Uttam	8.00	7.67	7.84	94.00	92.85	93.43
T ₁₂	Kashi Samriddhi	7.33	8.00	7.67	93.67	92.41	93.04
T ₁₃	Kashi Shakti	7.33	6.00	6.67	91.00	90.41	90.71
T ₁₄	Pant Uphar	6.67	7.33	7.00	92.00	92.33	92.17
T ₁₅	Magadi Local	11.00	12.00	11.50	87.67	81.00	84.34
S.Em(±)		0.59	0.62	0.58	1.46	1.39	1.10
C.D.@ 0.5%		2.31	2.41	2.41	3.00	2.86	2.27

germination of seeds (11.50) under field condition with respect to the variety Arka Apoorva (8.84) and variety Kashi Nandini taken least number of days for germination (5.00 days) which was on par with all the varieties except Arka Uttam (7.84) and Kashi Samriddhi (7.67).

Days taken for germination, it could be mainly due to the differences in genotypic variation and also due to genetic characteristic nature of the variety. The results are in accordance with the findings of Thakor *et al.* (2008) in vegetable pea and Singh *et al.* (2000) in cluster bean.

Germination Percentage

Data pertaining to germination per cent recorded from different treatments are presented in Table 2 significant differences were observed between the genotypes for germination percentage during 2019-20 and 2020-21 as well as for pooled average. From the two consecutive years pooled average revealed that Magadi Local recorded significantly minimum germination percentage (84.34%) under open field condition with respect to the variety Kashi Ageti (89.93%) and Kashi Shakti (90.71%) and variety Kashi Uday has recorded maximum germination percentage (94.66%) which was on par with all the varieties.

Significant variation in germination per cent among different varieties might be due to differences in their inherent capacity to germinate and it is possible that the varieties might not have not expressed their genetic potential. These findings are in accordance with the findings of Singh and Singh (2011) and Sharma and Bora (2013) in garden pea.

Plant height in (cm) recorded at 30, 60, 90 DAS

Plant height is considered as an important trait in pea cultivation from management aspect. In this study, pea varieties differed significantly for this trait at all growth stages of 30, 60, 90 days of sowing are presented in Table 3. Analyzed mean data and its range for the fifteen genotypes with respect to Plant height are presented in Table 2. A pooled mean analysis of two year's data revealed that significantly maximum number of branches per plant at 30 (27.87 cm) and

60 (52.70 cm) DAS was observed with Kashi Uday which was on par with varieties Arka Karthik (26.23 cm), (51.19 cm) and Arka Apoorva (25.80 cm), (47.32 cm). At maturity stage at 90 DAS the highest plant height (86.11 cm) was found in variety Arka Karthik which was at par with varieties Arka Apoorva (83.28 cm) and Kashi Uday (74.31 cm) and the least number of branches per plant at all growth stages of 30 (12.18 cm), 60 (34.16 cm), 90 (55.56 cm) days after sowing was recorded with Magadi Local.

The stages of plant growth variation among different pea varieties might be due to its genetical characters of individual variety, genetic heritability and growth variability among the variety, soil and climatic conditions favourable for vigorous growth and nutrition management. The similar results were obtained by Nagaraju and Pal (1990), Thorat *et al.* (2009) and Arora *et al.* (2011) in cluster bean and Kithi *et al.* (2016) in garden pea

Number of Branches per plant recorded at 30, 60, 90 DAS

The data in respect of number of branches per plant was recorded at 30th, 60th, and 90 DAS (Days after sowing) was found to be significantly different among the garden pea varieties and are presented in Table 3

From the pooled average from two consecutive years maximum number of branches per plant at 30 (4.33), and 60 (7.56) DAS was observed with Kashi Uday which was on par with varieties Arka Karthik 30 (3.39) and Arka Apoorva (3.49) and at maturity stage at 90 DAS the highest number of branches per plant (14.88) was found in variety Arka Karthik which was at par with varieties Arka Apoorva (13.01) and Kashi Uday (12.14) and the least number of branches per plant at all growth stages of 30 (2.12), 60 (4.63), 90 (6.60) Days after sowing was recorded with Magadi Local.

Number of branches could be attributed to the requirement of developing plants for more quantum of carbohydrates, which might have forced the plants of these varieties to produce more number of branches and another reason of increase in number

TABLE 3
Plant Height (cm) & Number of Branches per plant in different Varieties of peas grown under open field condition

Treatments	Plant height in cm at 30,60 and 90 DAS									Number of branches per plant at 30,60, and 90 DAS								
	30 DAS			60 DAS			90 DAS			30 DAS			60 DAS			90 DAS		
	2019	2020	Pooled	2019	2020	Pooled	2019	2020	Pooled	2019	2020	Pooled	2019	2020	Pooled	2019	2020	Pooled
T ₁	22.54	20.78	21.66	44.23	42.29	43.26	61.98	62.96	62.47	2.65	2.26	2.46	6.27	5.20	5.73	8.60	8.29	8.45
T ₂	21.39	23.86	22.63	41.41	38.44	39.93	56.35	53.86	55.10	2.51	2.23	2.37	5.72	5.48	5.60	9.15	8.24	8.69
T ₃	26.89	25.18	23.50	43.91	40.55	42.23	68.41	65.75	67.08	3.87	2.35	2.74	6.22	5.89	6.06	8.07	7.48	7.77
T ₄	28.47	27.28	27.87	54.11	51.28	52.70	78.03	70.59	74.31	3.60	5.13	4.33	7.82	7.29	7.56	12.81	11.47	12.14
T ₅	14.72	12.37	13.54	46.83	39.69	43.26	54.85	57.17	56.01	3.03	2.83	2.93	6.33	5.87	6.10	9.19	8.40	8.80
T ₆	17.34	14.21	15.78	44.14	31.54	37.84	58.03	58.57	58.30	3.13	2.79	2.96	6.01	5.30	5.66	8.52	7.61	8.07
T ₇	18.75	12.61	15.68	44.88	33.15	39.01	56.31	58.67	57.49	2.73	2.48	2.61	5.62	5.39	5.51	8.45	7.53	7.99
T ₈	22.70	21.41	22.06	46.04	43.20	44.62	67.12	68.52	67.82	3.15	2.60	2.88	6.08	5.50	5.79	9.10	8.48	8.79
T ₉	21.83	23.99	26.23	51.52	50.86	51.19	88.09	84.12	86.11	3.53	3.17	3.39	7.47	7.26	7.36	15.91	13.85	14.88
T ₁₀	27.72	23.89	25.80	53.05	41.59	47.32	83.73	82.82	83.28	3.17	3.10	3.49	7.13	7.07	7.10	13.20	12.82	13.01
T ₁₁	21.78	22.86	22.32	45.75	43.33	44.54	65.35	64.75	65.05	3.27	3.01	3.14	6.36	5.87	6.11	9.07	8.05	8.56
T ₁₂	26.76	25.22	25.99	46.27	42.13	44.20	68.53	67.33	67.93	3.00	3.16	3.08	7.20	6.60	6.90	11.39	10.80	11.10
T ₁₃	20.82	22.54	21.68	46.26	44.50	45.38	67.57	66.85	67.21	3.53	2.03	2.78	6.60	5.47	6.03	11.32	10.73	11.03
T ₁₄	18.53	26.46	22.50	38.37	36.62	37.50	75.53	71.54	73.53	3.08	2.75	2.91	7.13	6.21	6.67	8.73	8.47	8.60
T ₁₅	13.30	11.07	12.18	37.09	31.24	34.16	58.34	52.79	55.56	2.15	2.08	2.12	4.53	4.73	4.63	6.73	6.47	6.60
Sem±	0.605	0.914	0.483	0.929	0.935	0.716	1.590	1.178	1.011	0.245	0.202	0.157	0.155	0.232	0.206	0.207	0.506	0.301
CD@5%	1.753	2.649	1.400	2.692	2.708	2.073	4.606	3.412	3.412	0.709	0.586	0.455	0.450	0.671	0.596	0.599	1.465	0.872

of branches might be due to the enhanced cell division which increased the number of vegetative buds on the main stem. The variation in number of branches among different vegetables was also reported by Thakur *et al.* (1997) in vegetable pigeon pea, Kumar *et al.* (2011) and Singh and Singh (2011) and Khan *et al.* (2013) in garden pea.

Number of Leaves

The data in respect of number of leaves per plant was recorded a 90 DAS (Days after sowing) was found to be significantly different among the garden pea varieties and are presented in Table 3. A pooled mean analysis of two year's data revealed that at maturity stage 90 DAS, the maximum number of leaves per plant (53.66) was observed in the variety Arka Apoorva which was found at par with the varieties Arka Karthik (52.53) and Arka Uttam (52.05) and which was on par with all the varieties whereas,

minimum number of leaves per plant (31.87) were recorded with Magadi Local.

Numbers of leaves per plant were influenced by the genetic and environmental factors. Increase in the number of leaves per plant might be due to the increased number of branches per plant.

Number of leaves on a plant is fixed mainly by the genetic nature of the plant and the arrangement and nature of leaves on the stem. The variation in number of leaves among different varieties was also reported by Umesh Thappa *et al.* (2020) and Mukherjee *et al.* (2013) in Garden Pea.

Internodal Length (cm)

Analyzed mean data and its range for the fifteen genotypes with respect to internodal length revealed significant differences are presented in Table 4. A pooled mean analysis of two year's data revealed

TABLE 4
Number of leaves per plant and Internodal Length (cm) in different Varieties of peas grown under open field condition at 90 DAS

Treatment	Varieties	Number of leaves/plant			Internodal Length (cm)		
		2019	2020	Pooled data	2019	2020	Pooled data
T ₁	Kashi Mukti	34.80	33.76	34.28	5.20	4.27	4.73
T ₂	Kashi Ageti	35.87	34.53	35.20	6.19	5.59	5.89
T ₃	Kashi Nandini	38.87	32.99	35.93	6.57	5.50	6.03
T ₄	Kashi Uday	39.80	34.27	37.03	6.57	6.37	6.47
T ₅	PSM-2	46.56	44.73	45.65	6.25	4.79	5.52
T ₆	PSM-3	42.53	39.89	41.21	6.13	5.73	5.93
T ₇	PSM-4	40.53	34.33	37.43	5.45	5.19	5.32
T ₈	PSM-6	42.28	39.18	40.73	6.93	6.20	6.57
T ₉	Arka Karthik	53.94	51.12	53.66	7.37	7.44	7.41
T ₁₀	Arka Apoorva	55.27	52.05	52.53	7.49	7.16	7.33
T ₁₁	Arka Uttam	52.66	52.14	52.40	6.24	5.96	6.10
T ₁₂	Kashi Samriddhi	46.84	37.31	42.07	5.76	6.11	5.94
T ₁₃	Kashi Shakti	46.66	43.20	44.93	6.44	5.03	5.73
T ₁₄	Pant Uphar	45.49	43.67	44.58	6.04	5.47	5.76
T ₁₅	Magadi Local	32.56	31.17	31.87	4.85	4.70	4.78
S.Em(+)		1.58	1.19	1.12	0.139	0.154	0.113
C.D.@0.5%		4.58	3.45	3.25	0.402	0.446	0.326

that at maturity stage 90 DAS, the highest intermodal length (7.41 cm) was found in variety Arka Karthik which was on par with Arka Apoorva (7.33 cm) and Kashi Uday (6.47 cm) and the least the internodal length (4.78 cm) was obtained in Magadi Local.

The extent of internodal elongation is affected by the ambient temperature. Gibberelic acids are the plant hormones responsible for internodal elongation; they produce a wide range of physiological response in plants which have the ability to cause an increase in length of axis which causes increasing in length of internode. These findings are in consistent with Singh & Singh (2011) and Phom *et al.* (2014) findings in vegetable pea & Nagaraju *et al.* (1990) in Garden pea.

Chlorophyll Content (n.mol/cm²)

Chlorophyll content recorded by using Chlorophyll Meter SPAD-502, the data collected on five randomly

selected plants on young leaves at flowering stage and reading was taken and average was worked out. The data presented in Table 5 revealed that leaf chlorophyll content differed significantly among the garden pea varieties. From the two years average, maximum chlorophyll content (58.38 n.mol/cm²) were observed with Arka Apoorva and Arka Karthik (57.27 n.mol/cm²), which was found to be on par with the varieties Kashi Uday (54.70 n.mol/cm²) whereas the minimum chlorophyll content (39.96 n.mol/cm²) was recorded in variety Magadi Local.

Chlorophyll is a major chloroplast component and has a positive relationship with photosynthetic rate. Nitrogen is a component of the chlorophyll structure in plant tissues. Under stress conditions, a decline in chlorophyll content was associated with changes in nitrogen metabolism as a result of proline synthesis to maintain osmotic adjustment reduction in total chlorophyll content leads to a reduction in

TABLE 5

Chlorophyll content & Relative water content among varieties of peas grown under open field condition

Treatment	Varieties	Leaf Chlorophyll Content n.mol/cm ²			Relative Water Content (%)		
		2019	2020	Pooled data	2019	2020	Pooled data
T ₁	Kashi Mukti	50.37	47.67	49.02	32.80	35.80	34.30
T ₂	Kashi Ageti	51.79	49.09	50.44	33.87	34.07	33.97
T ₃	Kashi Nandini	51.17	54.40	51.98	38.27	36.33	39.17
T ₄	Kashi Uday	52.73	56.66	54.70	43.13	43.53	43.33
T ₅	PSM-2	46.35	48.47	47.41	42.67	32.60	37.63
T ₆	PSM-3	48.41	45.81	47.11	41.27	35.33	38.30
T ₇	PSM-4	49.54	50.56	50.05	40.53	36.33	38.43
T ₈	PSM-6	45.21	43.89	44.55	34.90	36.42	35.66
T ₉	Arka Karthik	56.29	58.25	57.27	45.19	48.12	46.66
T ₁₀	Arka Apoorva	59.21	57.55	58.38	49.17	46.87	48.02
T ₁₁	Arka Uttam	48.49	51.13	53.46	42.20	36.13	37.30
T ₁₂	Kashi Samridhhi	47.13	56.82	49.81	44.13	33.53	38.83
T ₁₃	Kashi Shakti	52.87	45.06	48.96	34.40	27.73	31.63
T ₁₄	Pant Uphar	52.01	54.91	52.78	36.53	34.00	35.27
T ₁₅	Magadi local	41.16	38.76	39.96	31.60	31.67	31.07
S.Em(+)		1.70	1.26	1.26	1.14	3.66	2.16
C.D.@0.5%		4.93	3.73	3.67	3.30	10.60	6.26

photosynthesis. These findings are in consistent with findings of Divya *et al.* (2014) in Dolichos bean.

Relative Water Content (%)

The data presented in Table 6 revealed that, relative water content differed significantly among garden pea varieties at maturity stage (90 DAS). Data pertaining to Relative water content as responded by different treatments are summarised in Table 5. From the two years average, maximum relative water content were observed with Arka Apoorva (48.02%) Arka Karthik (46.66%) and Kashi Uday (43.33%) which was found to be on par with the varieties respectively whereas, minimum relative water content (31.07%) was recorded in variety Magadi Local .

Relative water content (RWC) is probably the most appropriate measure of plant water status in terms of the physiological consequence of cellular water deficit. Water potential as an estimate of the energy status of plant water is useful in dealing with water transport in

the soil-plant-atmosphere continuum. These findings are in consistent with findings of Nagajothi *et al.* (2014) in Pigeon Pea.

Leaf Area (cm²)

The data presented in Table 6 revealed that, leaf area differed significantly among garden pea varieties at maturity stage (90 DAS). From the two years average the maximum leaf area (936.05 cm²) was recorded in the variety Arka Apoorva which was found at par with the varieties Arka Karthik (854.11 cm²) and Arka Uttam (823.19 cm²), whereas, the minimum Leaf Area (517.86 cm²) was recorded in the variety Magadi Local.

Changes in leaf area are mainly due to activation of cell proliferation, enhanced cell expansion which produces large leaves due to an increase in the cell number. Cell proliferation or cell expansion contribute to enlarged leaves, these findings are in confirmation with findings of Divya *et al.* (2014) in Dolichos bean.

The present experimental findings, it can be concluded that Arka Karthik is found to be the best for growth parameters under open field condition. Arka Apoorva and Kashi uday also showed good performance for growth parameters. The lowest values were recorded in the variety Magadi local.

TABLE 6

Leaf area in different varieties of peas grown under Open field condition

Treatment	Varieties	2019	2020	Pooled data
T ₁	Kashi Mukti	734.20	753.34	743.77
T ₂	Kashi Ageti	661.80	609.67	635.74
T ₃	Kashi Nandini	633.28	612.15	622.72
T ₄	Kashi Uday	601.97	572.41	587.19
T ₅	PSM-2	583.24	550.36	566.80
T ₆	PSM-3	629.83	591.44	610.64
T ₇	PSM-4	585.72	550.33	568.02
T ₈	PSM-6	577.22	552.81	565.02
T ₉	Arka Karthik	849.93	858.29	854.11
T ₁₀	Arka Apoorva	950.10	922.01	936.05
T ₁₁	Arka Uttam	845.03	801.34	823.19
T ₁₂	Kashi Samriddhi	619.48	565.73	592.61
T ₁₃	Kashi Shakti	615.41	641.15	628.28
T ₁₄	Pant Uphar	829.74	843.91	836.83
T ₁₅	Magadi Local	512.91	522.81	517.86
S.Em(±)		34.230	23.718	23.660
C.D.@ 0.5%		99.160	68.709	68.539

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