Original Research Article

"Evaluation of Different Genotypes of Cowpea (*Vigna unguiculata* L.) for Growth, Yield & Quality Under Prayagraj Agro-climatic Condition"

ABSTRACT

Theexperiment **"Evaluation of differentgenotypes of cowpea(*Vignaunguiculata* L.)for growth, yield & quality under Prayagraj agro-climatic condition"** was conducted at Department of Horticulture, Naini Agricultural Institute, SHUATS, Prayagraj during 2022-23 in order to standardize the best genotype of Cowpea. KASHI NIDHI (G_8) found to be theearliest (3.0).TheCowpea genotypesKASHI NIDHI(G_8)hadnoticedmore yieldsperplant(587g), and per ha (168.03t/ha). under Allahabad agro climatic conditions. This variety also recorded desirable values for pod parameters like length of pod(32.53cm), weight of pod (110.07g), which are parameters deciding a better market acceptability. Thus, on the basis of growth characters, flowering behavior (36.87), and yield attributing characters, podparameters and Cowpea genotypes KASHI NIDHI (G_8) found to be promising. The highest profit and maximum benefit cost ratio (2.89) were observed in cowpea genotypes KASHI NIDHI (G_8).

Keywords: Cowpea,Varieties,growth,yieldand quality

INTRODUCTION

Cowpea [*Vigna unguiculata* (L.) Walp.] is one of the several species of the widely cultivated genus Vigna. Cowpea is a diploid species with a somatic chromosome number 2n=22. It is one of the most important pulse crops native to West Africa **(Vavilov, 1951).** Cowpea is called as a poor man˝s meat or vegetable meat due to its high amount of protein. The young leaves, pods, and peas contain vitamins and minerals, which are used for human consumptionand animal feed. Cowpea can withstand a considerable degree of drought and high rainfall and can be grown in almost all kinds of soils provided there is proper drainage. Cowpea is mainly grown in tropical and subtropical regions in the world for vegetable and grain purpose and to a lesser extent as a fodder crop. It is a most versatile pulse crop because of its smothering nature, drought tolerant characters, soil restoring properties and multi-purpose uses. As a pulse crop, cowpea fits well into most of the cropping systems. It is cultivated for its seed (green or dried), pods and/or leaves, which are consumed in a fresh form as a green vegetable, while snacks and main meal dishes are prepared from the dried grain **(Kumar**

and Shrikant 2017).

It is an annual long trailing vine, indeterminate in growth habit. Leaves are trifoliate and green in colour. Flowers have papilionaceous types of corollas with violet blue to pale pink flower. Pods are long, slender and pendant with sparely arranged bold seeds. The pods have great demandingulfcountriesandlargequantitiesareexporte d to Middle East.When dried, tender pods and green shelled seeds are consumed as a vegetable and a pulse. It can also be used as a green manure, fodder, cover, or catch crop. Considering the nutritive value, 100g of green pods of cowpea contain energy (34.00 kcal), protein (4.20mg), calcium (10.00mg), iron (4.70mg), vitamin A (2.40mg), vitamin C (35.00mg) and is also a good source of Lysine (Anonymous, 2006).Among the different pulses grown in the world, cowpea is grown in 14.13 million hectares with production of 4.51 MT and the productivity of 387.45 kg/ha-1. In India, the cowpea is grown in an area of about 3.91 million hectares with a production of 2.22 (+000 MT) havinga productivity of 564.15kg seed ha-1. A mean temperature of 27oC is optimum for pod formation and seed yield, though; it performs better in region with rainfall of 250-100mm per annum.Loamy soil is considered the best for the cultivation of cowpea with a pH value of 6- 7 for optimum growth. Varieties with shorter maturity dates are available for gardeners with a less lengthy summary. Apart from this, cowpea forms excellent forage and it gives a heavy vegetative growth and covers the ground so well that it checks the soil erosion. As a leguminous crop, it fixes about 70-240 kg/ha of nitrogen per annum. Cowpea is mainly grown in tropical and subtropical regions in the world for vegetable and seed purpose and to lesser extent as a fodder crop.

MATERIALS AND METHODS

The materials used and methods adopted in the present experiment **"Evaluation of different genotypes of cowpea (*Vigna unguiculata* L.) for growth, yield & quality under Prayagraj agro-climatic condition"** was carried during the Kharif season of 2023 at the Crop Research Farm,at Department of horticulture, Naini agriculture college, SHUATS, Prayagraj (U.P.) during the academic year 2022-24. The experiment was laid out in RBD considering the nature of factors under study andthe convenience of agricultural operation and efficiency, the experiment was laid out in Randomized Block Design comprised of 9 treatment combinations along with three replications. All the Genotypedetails include via;G_1 (AVT-II 2021/COPBVAR-1),G2 (AVT-II 2021/COPBVAR-2), G3 (AVT-II 2021/COPBVAR-3), G4 (AVT-II 2021/COPBVAR-4),G5 (AVT-II 2021/COPBVAR-5), G6 (AVT-II 2021/COPBVAR-6), G7 (AVT-II 2021/COPBVAR-7), G8 (KASHI NIDHI) , G9 (KASHI SUDHA). The data were recorded at 20, 40, 60 days. With 1st,2nd, 3rd harvesting.

RESULT AND DISCUSSION:

Days of 1st germination: The data pertaining to the mean Days of 1st germination as influenced by different treatment was recorded periodically during the crop growth stages and is presented in Table.No.1. The maximum day of germination (6.0 days) was observed in cowpea genotypes AVT-II 2021/COPBVAR-1 and followed with cowpea gen otypes AVT-II 2021/ COPBVAR-3 (5.00 days). The minimum days of germination (3.0 days) was observed in cowpea genotypes with followed in cowpea genotypes KASHI NIDHI.

Plant height: The data pertaining to the mean plant height as influenced by different treatment was recorded periodically during the crop growth stages and is presented in Table.No.1. The Plant height of cowpea was recorded at 20, 40 and 60 Days after sowing (DAS). At 60 DAS maximum plant height was observed in Cowpea genotype Kashi Nidhi(105.67cm), followed by in was cowpea genotypes AVT-II 2021/COPBVAR-5 (85.67cm). The minimum was (49.27cm) in Cowpea genotype AVT-II 2021/COPBVAR-1.

Similar results were reported by Nigude et al., (2004) in cowpea and Sawardekar (2007) in yard long bean. Also Kumar et al., (2017) and Dongarkar et al., (2013).Reason (Sheetal varieties is pole type and genetic make-up climate adoptability Under Prayagraj Agro-climatic condition).

Days of first flowering: The data pertaining to the mean Days to first flowering, as influenced by different treatment was recorded periodically during the crop growth stages and is presented in Table.No.1. The minimum number of Days of first flowering was observed in Kashi Nidhi (33.33days), followed by AVT-II 2021/COPBVAR-5 with (33.48 days) and whereas maximum was (37.6Days) recorded in AVT-II 2021/COPBVAR-1.The genotypes of Kashi Nidhi given minimum days to first flowering and observed due to the different location might be due to the favourableAgro-climatic conditionand variation in studied genotypes. Similar results observed by **Dadson *et al.*, (2011)** and **Sharma P *et al.*,(2019).**

Daysof 50%offlowering: The data pertaining to the mean Days to 50% flowering as influenced by different treatment was recorded periodically during the crop growth stages and is presented in Table.No.1. The minimum number of Days of first 50% flowering was recorded in KashiNidhi (38.67 days), followed by AVT-II 2021/COPBVAR-5 with and (39.67days) and whereas maximum was (44.32) recordedin AVT-II 2021/COPBVAR-1.The genotypes of Kashi Gouri given minimum days to 50% flowering and observed due to the different location might be due to the favourableAgro-climatic condition and variation in studiedgenotypes.Similarresultsobservedby**Dadson*et al.*, (2011)**and**SharmaP*et al.*, (2019**).

Number of Pod /plant: The data pertaining to the mean Number of Pod /plant as influenced by different treatment was recorded periodically during the crop growth stages and is presented in Table.No.1. The Number of Pod /plant of cowpea

was recorded at 1st, 2nd and 3rd harvest after sowing(DAS).At 3rd harvest maximum Number of Pod /plant was recorded in Kashi Nidhi (12.64), followed by Kashi Sudha with (11.96) and minimum was (8.65) recorded in AVT-II 2021/COPBVAR-1.Maximum Number of Pod/plants was recorded in Kashi Nidhi due to favourable condition and better adaptability under Prayagraj Agro-climatic condition. Similar results of number of pods per plant was observed by **Fageria*et al.*, (2011)** and **Subedi S *et al.*,(2019).**

Daystofirstpicking: The data pertaining to the mean plant height as influenced by different treatment was recorded periodically during the crop growth stages and is presented in Table.No.1.ThemaximumNumberofDaysofpodfirstpickingwasrecordedin AVT-II 2021/COPBVAR-1 (56.68 days) and minimum was (42.31) recorded in Kashi Nidhi and Kashi Sudha as followed by (44.93 days). Days to first picking in various cowpea

genotypes was recorded in Kashi Nidhri due to favourable condition, different location might be due to different Agro-climatic condition. Similar results of number of pods per plant was observed by**Fageria*et al.*, (2011)** and **Subedi S *et al*.,(2019).**

Yield Parameter: The data pertaining to the mean on Pod length(cm), Single pod weight (g), 10 Pod weight per plant (g), Days of pod maturity in plant, No. of seed per pod and Seed Colour as influenced by different treatment was recorded periodically during the crop growth stages and is presented in Table.No.1

Pod per length (cm) of cowpea the maximum pod length (cm) recorded in Kashi Nidhi (36.83cm), followed by AVT-II 2021/COPBVAR-7 with (34.53) and minimum was (13.33) recorded in AVT-II 2021/COPBVAR-5.Similar findings were previously reported by **Gupta S *et al.*, (2019).**

NumberofSeeds/pod,Themaximumnumberofseeds /podswasrecordedinKashi Nidhi(14.53),followedby Kashi Sudhawith(12.33)andminimumwas(10.93)recordedin AVT-II 2021/COPBVAR-1.

SeedColour: Pod colour recorded as Light colour was found in AVT-II 2021/COPBVAR-1, AVT-II 2021/COPBVAR-2, AVT-II 2021/COPBVAR-3,Dark Green colour was found in AVT-II 2021/COPBVAR-4, AVT-II 2021/COPBVAR-5.Green clour was found in AVT=II 2021/COPVAR-6, AVT-II 2021/COPBVAR-7, Kashi Nidhi, Kashi Sudha. The result of present finding are similar to that of **(Muhammad *et al.*, 2010 Dwivedi *et al.*, 2011.,and Gupta S *et al.*, 2019** who characterized cowpea genotypes for various agro- morphological characters like leaf shape, plant type, twining tendency, colour of flower and pod, days to first flower and days to maturity.

Podyield(Q/ha): The first picking Yield (g) in plant of cowpea The Pod Yield (q/ha) in plant of cowpea maximum was recorded in Kashi Nidhi (168.03q/h), followed by AVT-II 2021/COPBVAR-3 with (128.57q/ha) and minimum was (5.98) recorded in AVT-II 2021/COPBVAR-1.The maximum yield is Kashi Nidhi variety pod yield due to favourableAgro-climatic condition. Similar results of seed yield was observed by **Basaran *et al.*, (2011); Quaye *et al.*, (2011). Kandel P *et al.*, (2019).**

CONCLUSION:

From the above experiment finding it was concluded that, all the characters viz., growth parameters, flowering behaviour, yield and yield attributing characters, pod parameters varied significantly. Further, while studying the flowering behavior, Cowpeagenotypes **KASHI NIDHI**(G_8) found to be the earliest. The Cowpea genotypes **KASHI NIDHI** (G_8) had noticed more yields per plant and per ha. Under Prayagraj agro-climatic conditions. These variety alsorecordeddesirable values for pod parameters like length of pod, weight of pod, which are parameters deciding a better market acceptability. Thus, on the basis of growth characters, flowering behaviour, yield and yield attributing characters, pod parameters and Cowpea genotypes **KASHI NIDHI** (G_8) and Cowpea genotypes **KASHI SUDHA**(G_9) were found to be promising. However, it needs confirmation by conducting same investigation for next 2-3 seasons. From the above

experimental finding, it was concluded that thehighest profit and maximum benefit cost ratio (**3.70**).

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Table No.1 Evaluation of Different Genotypes of Cowpea (*Vigna unguiculata* L.) for Growth, Yield & Quality parameters

Notion	Days of Germintion	Plant Height after 60 days	Daysoffirst flowering	50 % of floweringdays	Flower colour	Podcolour	Number of Pod/plant(3rd harvesting)	Days to firstpicking	Daysof podmaturityinplant	Podyieldperplant (g)	Podyield[t/ha]
G_1	**6**	49.27	37.67	43.33	White	Light green	8.65	56.68	70.67	108.13	4.68
G_2	3.5	58.02	33.67	43.67	Yellow	Green	11.01	55.24	53.13	117.33	8.32
G_3	4.7	56.5	38.3	40.67	Light yellow	Green	10.95	48.27	62.67	166.8	6.27
G_4	3.1	62.67	35.5	41.24	Yellow	Light green	9.12	46.30	58.33	169.87	6.1
G_5	3.3	85.67	33.48	39.28	White	Light green	10.3	50.45	59.6	156.67	5.98
G_6	4	54.05	33.62	39.5	Light yellow	Green	11.7	52.01	69.27	176	6.15
G_7	3.1	97.33	36.2	42.05	Yellow	Green	9.66	47.56	62.53	177.27	8.18
G_8	**3**	105.67	33.33	38.67	White	Light green	12.64	42.31	52.07	187.27	11.09
G_9	3	94.13	34.67	43.67	Yellow	Green	11.96	44.93	54.13	128.27	9.26
SEd(±)	0.17	4.9	1.19	2.09	-	-	0.86	0.67	1.46	10.968	0.49
$CD_{5\%}$	0.34	9.79	2.59	5.37	-	-	1.72	1.34	3.02	22.638	1.01
CV	5.34	9.05	3.68	12.32	-	-	8.6	3.54	14.91	111.75	4.99