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Evaluation of cowpea genotypes for growth and yield characters

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Abstract
The present investigation on "Evaluation of cowpea genotypes for growth and yield characters" was carried out during the summer season in the year 2023. The study was undertaken on 10 genotypes of cowpea using a randomized block design with three replications. The genotypes were found to be varied for growth and yield attributing parameters. Among these 10 genotypes the highest plant height was recorded in genotype COPG-1 (38.42 cm) whereas the lowest plant height was observed in genotype COPG-10 (25.63 cm). The lowest days for fifty percent flowering were recorded in the genotype COPG-7 (60.00 days) while the genotype COPG-1 recorded the highest days to 50% flowering (73.67 days). COPG-1 (18.33 cm) recorded the highest pod length, whereas the lowest pod length was observed in COPG-10 (11.70 cm). In the case of pod diameter, the maximum was recorded in genotype COPG-1 (0.77 cm) and the minimum was recorded in genotype COPG-10 (0.67 cm). Similarly, for yield characteristics, *i.e.* number of pods per cluster, weight of pod, and yield per plant the genotype COPG-1 recorded the maximum number of pods per cluster (3.67), the highest weight of pod (9.23 g) and the highest yield per plant (263.67 g).

Keywords: Cowpea, genotypes, evaluation, growth, yield

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. According to Vavilov (1951) [14], this is one of the most significant native pulse crops from West Africa. Because of its high protein content, cowpeas are sometimes referred to as "poor man's meat" or vegetable meat. Vitamins and minerals found in the young leaves, pods, and peas are used as animal feed and human food. Cowpeas may be cultivated in nearly any type of soil as long as there is adequate drainage and they can tolerate both significant rainfall and extended periods of drought. The world's tropical and subtropical regions are where cowpeas are mostly farmed for their vegetables and grains, and to a lesser extent, as fodder crops. Because of its smothering nature, drought-tolerant traits, soil-restoring qualities, and multipurpose usage, it is one of the most adaptable pulse crops. Cowpea is a pulse crop that works well in most cropping systems. It is grown for its green or dried seeds, pods, and/or leaves, which are eaten raw as a green vegetable. The dried grain is used to make snacks and main course dishes (Kumar and Shrikant 2017) [7]. Consequently, it is critical to assess whether cowpea genotypes perform better in irrigated or rainfed circumstances in order to increase production and characteristics that contribute to yield. This will help cowpea become self-sufficient.

Materials and Methods
The experiment was conducted at Western block, Central Research Station, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola (MS.) during summer 2023. The material for the study was comprised of 10 cowpea genotypes. The genotypes were raised in field experiment in randomized block design with three replications. Growth and yield attributing parameters were studied and data was collected from the five randomly selected plants from each plot. The data collected on different parameters was subjected to statistical analysis as per method of analysis prescribed by Panse and Sukhatme (1995) [11].

Results and Discussion

Analysis of variance for the mean of characters showed highly significant differences among different genotypes. The genotype COPG-1 (38.82 cm) recorded the highest plant height which is followed by genotype COPG-4 (36.27 cm). The lowest plant height was observed in the genotype COPG-10 (25.63 cm). Similar results were reported by Bisikwa *et al.* (2014) [3].

The highest number of primary branches was recorded in the genotype COPG-1 (7.37) which was at par with genotype COPG-4 (6.73), COPG-2 (6.43) and COPG-8 (6.40). The genotype COPG-10 recorded the lowest (5.23) number of primary branches per plant. These results are matching with the findings for a number of branches reported by Patil *et al.* (2015) [12].

Days to 50% flowering was varied statistically among the genotypes studied during the investigation. The lowest days for 50% flowering were recorded in the genotype COPG-7 (60.00 days) which was at par with COPG-8 (62.33) and COPG-3 (61.00). The genotype COPG-1 recorded the highest days to 50% flowering (73.67 days). 50% flowering depends on the interaction of many complex processes such as both environmental and genetic factors. More or less comparable results were reported by Khanpara *et al.* (2016) [6].

The highest pod length was recorded by COPG-1 (18.33 cm) which is followed by genotype COPG-4 (17.23 cm). The lowest pod length was observed in genotype COPG-10 (11.70 cm). Similar findings were also reported by Mali *et al.* (2021) [9].

Pod diameter ranged from 0.77-0.67 cm. Minimum pod diameter (0.67 cm) was recorded for genotype COPG-10 while maximum was recorded for genotype COPG-1 (0.77 cm) followed by genotype COPG-2 (0.74 cm). A similar range for pod diameter reported by Jogdhandhe *et al.* (2017) [5].

The genotype COPG-1 (3.67) recorded the highest number of pods per cluster which was at par with genotypes COPG-4 (3.40), COPG-2 (3.23) and COPG-8 (3.23). The lowest number of pods per cluster was observed in the genotype COPG-10 (2.00). These findings are in accordance with the work of Manju Devi and Jayamani (2018) [10].

Concerning the pod weight, COPG-1 (9.23g) recorded the maximum pod weight followed by genotype COPG-4 (8.40 g) and genotype COPG-2 (8.13 g) the minimum pod weight was noticed in the genotype COPG-10 (5.80 g). The observations for pod weight in the present studies are in line with the work of Jogdhandhe *et al.* (2017) [5].

The genotype COPG-1 (263.67 g) recorded the highest yield per plant which was followed by genotype COPG-4 (255.00 g). The lowest yield per plant was observed in the genotype COPG-10 (176.33 g). A similar range for yield per plant were reported by Khanpara *et al.* (2016) [6] and Diwaker *et al.* (2017) [4].

Fig 1: General View of experimental plot

Fig 2: Variation in pod length

Table 1: Estimated mean of characters

Genotype	Plant Height (cm)	Number of Primary Branches	Days to 50% flowering	Pod length (cm)	Pod diameter (cm)	Number of pods per cluster	Weight of pod (g)	Yield per plant (g)
COPG-1	38.82	7.37	73.67	18.33	0.77	3.67	9.23	263.67
COPG-2	35.07	6.43	70.33	16.63	0.74	3.23	8.13	249.33
COPG-3	31.37	6.20	61.00	14.50	0.71	2.67	7.77	194.33
COPG-4	36.27	6.73	66.00	17.23	0.72	3.40	8.40	255.00
COPG-5	28.87	6.00	65.00	12.30	0.71	2.90	6.80	184.33
COPG-6	30.73	5.57	63.67	15.23	0.73	2.80	7.57	242.00
COPG-7	32.33	6.27	60.00	14.50	0.70	2.60	7.03	197.33
COPG-8	26.83	6.40	62.33	15.80	0.69	3.23	6.97	232.67
COPG-9	32.20	6.20	66.67	15.33	0.71	2.33	7.13	214.33
COPG-10	25.63	5.23	63.00	11.70	0.67	2.00	5.80	176.33
SE(m)	0.33	0.34	0.93	0.19	0.01	0.20	0.08	1.55
C.D. at 0.5%	0.99	1.01	2.78	0.56	0.02	0.59	0.23	4.65

Conclusion

It can be concluded that all the characters *viz.*, growth parameters, flowering behaviour, yield and yield attributing characters, and pod parameters were varied significantly. The genotype COPG-1 recorded the highest yield per plant. This genotype also recorded the highest number of primary branches, number of pods per cluster, highest pod length, pod diameter and weight of pod. Thus, on the basis of growth characters, yield and yield attributing characters and pod parameters genotypes COPG-1 and COPG-4 were found to be promising.

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