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Short Communication

Correlation and Path Analysis in Vegetable Cowpea

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ABSTRACT

The genotypic and phenotypic correlations of green pod yield with different components were estimated from 50 genotypes of vegetable cowpea. The genotypic and phenotypic correlations agreed closely with each other. Yield contributing character number of pods per plant had positive and highly significant association with pod yield per plant at phenotypic level. Phenotypic interrelationship between days to 50 @ flowering and days to 1st pod picking was negatively significant with green pod yield. The genotypic and phenotypic path analysis revealed the high to moderate direct effect of green pod yield per plant with number of pods per plant and pod length. Therefore, number of pods per plant and pod length was important component for improving green pod yield in vegetable cowpea.

Keywords: Cowpea; Correlation; Path analysis

INTRODUCTION

Cowpea (*Vigna unguiculata* (L.) Walp.) is native of central Africa. It is grown as mainly as vegetable, for seed and to a lesser extent as a fodder crops. Cowpea contains 24 per cent protein, 60 per cent carbohydrate and 2 per cent fat besides being good sources of vitamins and phosphorus. Cowpea is extensively grown in states of Rajasthan, Gujarat, Andhra Pradesh, Karnataka and Tamil Nadu. The productivity potential of cowpea in Tamil Nadu is low (265 kg ha^{-1}) as compared to the national productivity. This clearly indicates the necessity to identify the reason for such a low productivity in India and particularly in Tamil Nadu [1]. Cowpea fits well in a variety of cropping systems and is grown as cover crop, mixed crop, catch crop and green manure crop. Cowpea also serves as an ideal crop for soil and water conservation because of its ability to grow fast and cover the soil surface quickly [2]. It is widely adapted and capable of producing seeds even in low land and semi-arid regions. However, grain yield of this legume varies widely when grown at different location. Yield is a polygenic complex character and is influenced by number of component traits which are in turn interrelated. Study on association of yield with yield components is important to the plant breeder for fixing up the characters which have a decisive role in influencing the yield. Therefore, the degree of association of different characters which are statistically determined by correlation coefficients had been utilized as the criteria for selection of different traits. The present investigation was under taken to assess the importance of various component of green pod yield in vegetable cowpea [3].

DECSRIPTION

The field experiment was conducted to evaluate the performance of different vegetable cowpea genotypes procured from different locations. The selected genotypes were sown in a Randomized Block Design (RBD) with three replications in kharif and summer season. Each genotype was sown with inter row spacing of 30 cm and inter plant spacing of 15 cm under drip irrigation. The agronomic practices were followed. As per the package of practices of TNAU. Five plants were randomly selected from each of the genotype per replication for observation. The observations were recorded on 15 morphological characters viz., plant height, number of primary branches, days to first flowering, days to 50 per cent flowering, number of flowers per inflorescence, days to first harvesting, number of harvestable green pods per plant, length of pod (cm), girth of pod (cm), number of seeds per pod, individual green pod weight (g), total green pod yield in hectare, ascorbic acid, crude fibre and crude protein were studied.

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The correlation co-efficient and path co-efficient analysis were analysed [4]. The character association studies revealed that the strong and positive association for plant height, number of primary branches per plant, days to first flowering, number of flowers per inflorescence, number of pods per plant, pod length, pod girth, individual pod weight and ascorbic acid in both kharif and summer. The path analysis studies revealed that the highest direct effect of number of pods per plant, pod weight, pod length, number of primary branches per plant, plant height towards pod yield during kharif. The highest direct effect of number of pods per plant, pod weight, days to 50 per cent flowering, days to first flowering towards pod yield during summer [5].

In the present study, days to first flowering had significant and positive correlation with pod yield per plant. The trait number of pods per plant showed highly significant and positive correlation with pod yield per plant was observed between these (kharif and summer) traits. Similar positive association was reported by Singhal, et al. The character of pod length showed, significant and positive association with pod yield per plant kharif and summer Romanus, et al. The correlation of plant height, number of primary branches, days to first flowering, number of flowers per inflorescences, number of pods per plant, length of pod and individual pod weight with pod yield per plant was highly significant and positive in kharif and summer. These results indicated that the high yielding ability might be associated with these yield components.

The number of inflorescence per plant, plant height and number of seeds per pod had low positive direct effects on pod yield and agree with the findings of Upadhyay and Mehta. However, high positive indirect effect was noticed through number of seeds per pod during kharif and summer.

These results were in accordance with the findings of Kalaiyarasi and Palanisamy. It also exhibited high negative indirect effect through number of pods per plant, but it was interesting result of path coefficient analysis.

CONCLUSION

Through all other remaining traits the indirect effects were low in magnitude either in positive or negative in direction. From the traced out pathways and associations it was found that, pod length, pod weight, number of pods per plant and number of seeds per pod showed higher total associations in almost all the genotypes in both kharif and summer. Above these traits exhibited a high positive direct effect on pod yield per plant. They also exhibited significant indirect contribution on yield through component traits could be used as yield determinants for further improvement in the population.

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