ASSOCIATION ANALYSIS IN COWPEA
(VIGNA UNGUICULATA L. WALP)

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ABSTRACT

Thirty genotypes of cowpea (Vigna unguiculata L.) exhibited high genotypic co-efficient of variation than phenotypic co-efficient of variation for all the characters. Maximum phenotypic and genotypic co-efficient of variation was recorded by seed yield per plant followed by pods per plant and clusters per plant. High heritability was recorded by seed yield per plant followed by seeds per pod, pod length and hundred seed weight. Genetic advance as per cent of mean was higher for seed yield per plant followed by pods per plant and clusters per plant. Seed yield had positive and significant association with pod length.

INTRODUCTION

The information on association of traits with seed yield and among themselves and the extent by which they are influenced by the environment is a pre-requisite for any breeding programme. The various yield components very often exhibit considerable degree of association which may be due to linkage or developmental genetic interaction. The development of genetic kind is by far the commonest (Simmonds, 1979). The association between characters may differ in the progenies of the crosses in which divergent parents are involved. With this view a study was made to understand the nature of correlations among yield and yield components in cowpea genotypes.

MATERIAL AND METHODS

Thirty genotypes of cowpea collected from various sources in India were evaluated in Plant Breeding Farm, Faculty of Agriculture, Annamalai University, Annamalainagar, Tamilnadu, India. The experiment was carried out during 2001 in RBD design replicated thrice. The spacing adopted was 45x15 cm and recommended cultural practices were followed. Ten plants were selected in each genotype and biometrical observations were recorded on ten metric traits namely, days to first flower, plant height, number of branches per plant, number of clusters per plant, number of pods per cluster, pod length, number of seeds per pod, number of pods per plant, hundred seed weight and seed yield per plant on single plant basis. The phenotypic and genotypic co-efficient of variation, heritability and genetic advance were worked out by making use of appropriate formula (Johnson et al., 1955). Genotypic and phenotypic correlations were calculated as per Robinson et al. (1951).

RESULTS AND DISCUSSION

The variability parameters among ten characters estimated on the basis of phenotypic and genotypic variances are given in Table 1. The phenotypic co-efficient of variation ranged from 4.24 to 37.96 per cent. Highest phenotypic co-efficient of variation was recorded for seed yield per plant (37.96 per cent) followed by number of pods per plant (27.02 per cent). Hundred seed weight, branches per plant, plant height, seeds per pod, pod length and pods per cluster recorded moderate phenotypic co-efficient of variation (10-20 per cent) in the decreasing order. But low phenotypic co-efficient of variation (<10 per cent) was observed for the character days to first flower (4.24 per cent).

The genotypic co-efficient of variation ranged from 3.79 to 37.41 per cent. Maximum value was noted for seed yield per plant (37.41 per cent). Moderate value was found for characters pod length, plant height, seeds per pod and hundred seed weight in increasing order. Clusters per plant, pods per cluster and days to
The first flower recorded very low per cent. From this analysis, the phenotypic coefficient of variation was higher than genotypic coefficient of variation in all the characters depicting that the apparent variation is not only due to genotype, but also due to influence of environment. This is in consonance with the findings of Rajaravindran and Vijendra Das (1997) and Venkatesan et al. (2003a).

The heritability values were more for hundred seed weight, seed yield per plant, seeds per pod, clusters per plant, seeds per pod, clusters per plant.
per plant, pod length, pods per plant, days to first flower and plant height. This goes in support of the findings of Balakrishnan (1998) and Venkatesan et al. (2003b). High level of heritability provides a good promise to plant breeder for direct selection of metric trait on the phenotypic performance.

The highest value of genetic advance as per cent of mean was observed for seed yield per plant, pods per plant, hundred seed weight, clusters per plant, seeds per pod, pod length and plant height. This is similar to the findings of Balakrishnan (1998). Heritability along with genetic advance as per cent mean is usefully more helpful than the heritable value alone in predicting the result of selecting the best individual. The data clearly showed that the trait hundred seed weight, seed yield, pods per plant, clusters per plant and plant height possessed both high heritability and high genetic advance. This goes on par with the reports of Rewale et al. (1995). Therefore, it was amply clear that these traits were less influenced by the environmental changes and hence improvement in these traits would be more effective through the selection owing to their additive gene effects.

The association analysis was carried out to study the nature and magnitude of association between yield and other component characters are presented in Table 2. Plant height recorded positive and significant association with clusters per plant and pods per plant and branches per plant with pod length and seeds per pod. Whereas, pod length had positive and significant correlation with seeds per pods, pods per plant and seed yield per plant. This indicates seeds per pod depend on pod length. This is in agreement with the findings of Chattopadhyay et al. (1997). Seed yield exhibited positive and significant correlation only with pod length. This is in agreement with the findings of Chattopadhyay et al. (1997). Seed yield exhibited positive and significant correlation only with pod length.

REFERENCES