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RESEARCH ARTICLE

Genetic variability and association of late leaf spot resistance and productivity in groundnut (*Arachis hypogaea* L.)

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ABSTRACT

Large amount of variability was present for pod yield (PY) and resistance attributes like leaf are affected (LAA) and defoliation percentage (DF) in most of the segregating material of groundnut. The association analyses revealed the possibility of breaking undesirable linkages by shuffling genes through three way and back crossing designs. Higher proportion of desirable recombinants for most of the character combinations were observed in these cross categories. Single and double crosses were poor in giving superior recombinants. The non-significant correlation between yield and resistance indicated the possibility of incorporating disease resistance into the adapted cultivar without affecting the yield potential. But even in back and three way crosses frequencies of superior recombinants were considerably low revealing the existence of some amount of undesirable association between characters indicating the need for reshuffling of genes through selective inter-mating.

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INTRODUCTION

The low productivity in groundnut is attributed to several production constraints among which the widespread occurrences of foliar diseases are the major factor. Three major foliar diseases *viz.*, late leaf spot [*Phaeoisariopsis personata* (Berk. and Curt.) V. Arx] , early leaf spot (*Cercospora arachidicola* Hori) and rust (*Puccinia arachidicola* Speg.) are most destructive, causing yield losses upto 70 per cent (Subrahmanyam *et al.*, 1980). Over 50 per cent less in pod and fodder yield has been estimated due to late leaf spot disease in Karnataka (Reddy, 1984). The present study aims at determining the genetic variability and association of late leaf spot resistance and productivity parameters.

MATERIALS AND METHODS

To generate the experimental material, four groundnut genotypes were used. Two widely cultivated Spanish bunch varieties but susceptible to late leaf spot disease (TMV2 and JL 24) were used as ovule parents and two resistant germplasm lines (RMP 12 and PI 393516) were used as male parents (Table 1) [9]. The crossed material is generated using different mating designs like single, back, three-way and double crosses and the segregating material was advanced from S_1 to S_3 generation under different selection schemes.

Observations were recorded on yield/productivity parameters like pod yield per plant (PY), shelling percentage (SP) and hundred seed mass (HSM) and foliar disease resistance components *viz.,* defoliation percentage (DF), leaf area affected (LAA) and remaining green leaf area percentage (RG).

The statistical analysis for data on each character was carried out using individual plant observations. Phenotypic co-efficient of variation (PCV), broad sense heritability (H), genetic advance over mean (GAM), phenotypic correlation co-efficient(r) were computed by using appropriate equations. The number of