



Mating designs for improving late leaf spot resistance in groundnut (*Arachis hypogaea* L.)

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Abstract : Different crosses of groundnut were evaluated in generating productive, late leaf spot resistant segregants with desirable agronomic features. A large amount of variability was observed for pod yield and resistance when the single and multiple crosses were advanced from s_1 to s_3 generation by different selection schemes. Back cross and three way crosses were marginally superior over other crosses in mean performance and frequency of desirable segregants for all the yield parameters. On the other hand, single and double crosses were more resistant to late leaf spot. Higher proportion of desirable recombinants in three way and back crosses revealed the possibility of breaking the undesirable linkages in these cross categories. Single and double crosses were poor in giving superior recombinants indicating the need for selective inter-mating between desirable groups.

Key Words : Groundnut, Late leaf spot, Resistance, Mating designs

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INTRODUCTION

The average groundnut yield in India remains stagnant below 1000 kg/ha as against world average of 1125 kg/ha and 2760 kg/ha realized in U.S.A (Nigam *et al.*, 1991). The low productivity is attributed to several production constraints, among which the widespread occurrence of foliar diseases is the most important one. Late leaf spot of groundnut [*Phaeoisariopsis personata* (Berk. and curt.) V.Ar.] can cause total defoliation and greatly reduce the yield. Genetic studies indicated that leaf spot resistance is quantitatively inherited with a large additive effect (Walls and Wynne, 1985). Multiple crosses involving three, four or more parents, each with superior characteristics, are expected to produce greater variability and widen the genetic base. In the present investigation an effort was made to elucidate the potentiality different multiple crosses *viz.*, three-way cross, back cross and double cross in generating segregants with late leafspot

resistance and productivity.

MATERIALS AND METHODS

The ovule parents TMV2 (designated as A) and JL24 (designated as B) were widely cultivated Spanish bunch varieties but susceptible to late leaf spot disease. The male parents RMP 12 (C) was resistant to late leaf spot and PI 393516(D) was a proven source of late leaf spot and rust resistance (Subrahmanyam *et al.*, 1989). The selection employed was aimed at obtaining superior plants in productivity disease resistance attributes. A total of 6915 plants obtained from 376 F_1 hybrid plants were evaluated crosswise in s_1 generation (Table A). Single cross (SC) and various multiple crosses *viz.*, three way cross (TWC), back cross (BC) and double cross (DC) were generated. Individual plants in each cross that exceeded mean +2 standard deviation with respect to pod weight and remaining green leaf area were

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