



RESEARCH ARTICLE

# Selection systems for late leaf spot resistance in groundnut (*Arachis hypogaea* L.)

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## ABSTRACT

Single and multiple crosses were advanced from  $S_1$  to  $S_3$  generation by three selection schemes such as scheme I (single seed bulk), scheme II (selection for yield and resistance) and scheme III (selection for only resistance). Different types of selection schemes along with crosses have shown large amount of variability for pod yield and resistance attribute like leaf area affected and defoliation. Breeding methods did not differ much for heritable variation. Among the different breeding methods employed, scheme I retained higher variability for productivity attributes and scheme III for resistance components. The material forwarded through scheme I and II gave higher frequency of desirable recombinants than scheme III. However, scheme II involved additional cost and efforts as compared to single seed descent method. Based on the results, a comprehensive breeding approach for developing disease resistant and productive cultivars has been discussed.

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## INTRODUCTION

Foliar diseases particularly leaf spots and rust are the major factors limiting yield and quality in groundnut. Most of the groundnut cultivars in India are highly susceptible to foliar diseases. Usually in India, all these diseases occur together causing yield losses up to 70 per cent (Hegde *et al.*, 1995). But late leaf spot is more prevalent and damages the plant by reducing the available photosynthetic area by lesion formation finally stimulating leaflet abscission leading to extensive defoliation and hence affecting both quantity and quality of haulms. Fungicidal sprays are effective in controlling these diseases, but the use of disease-resistant cultivars is a better approach. A number of resistant germplasm lines are available but many other undesirable attributes limit their utility as cultivars. Attempts have been made to produce high yielding disease resistant cultivars through hybridization, but the lines developed either had only moderate resistance or retained

one or more undesirable features. Early generation testing for yield and other characters is an alternative method to accelerate generation advance, which considerably reduces the cost of the whole improvement programme by reducing the input of labour and management. Acceptable breeding lines were selected by using early generation trials in groundnut (Cofflet and Hammons, 1974). The objective of the present study is to evaluate suitability of selection schemes in early generation for producing productive segregants with resistance to late leaf spot and desirable agronomic features.

## MATERIALS AND METHODS

Two widely cultivated Spanish bunch varieties but susceptible to late leaf spot disease (TMV2 and JL 24) were used as female parents and two resistant germplasm lines (RMP 12 and PI 393516) were used as male parents (Motagi *et al.*, 1999). Single and multiple crosses *viz.*, back, three-way