

Thesis Title Heritability of resistance to black leafspot
 in groundnut
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Thesis Advisory Committee

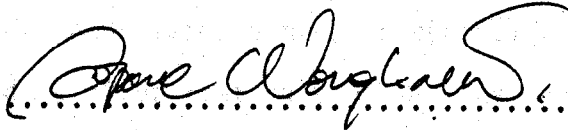


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Abstract

A study was conducted to estimate the heritabilities of components of resistance to black leafspot caused by *Phaeoisariopsis personata* in cultivated groundnut and to examine the relationships among these components both in field and greenhouse evaluations. F₃ progenies from six crosses involving resistant x resistant parents, resistant x susceptible parents, and susceptible x susceptible parents were evaluated for components of resistance to black leafspot along with their parents both in the field and in the greenhouse using a

detached leaf technique. The parental data were analyzed to evaluate the effectiveness of the characters in differentiating the lines. Broad sense heritabilities were calculated for the individual characters measured in each cross. Correlation coefficients were determined among the characters measured in the field or in the greenhouse and among the characters measured in the field and those measured in the greenhouse.

The results showed that disease score at 80 days and percent necrotic area and lesion number at 90 days after planting were most effective in field evaluation, while sporulation was most effective in greenhouse evaluation, followed by lesion size, percent defoliation, percent necrotic area, and lesion number, respectively. For greenhouse evaluation, 20-25 days after leaf cutting was the suitable time for data taking. Heritability estimates for these characters were low in almost all the crosses, except in few crosses in which the heritabilities were comparatively high in some characters. These results suggested that selection in early generation based on phenotype of the individual plants would be ineffective. Under field condition, disease score at 80 days, lesion size, lesion number, and percent necrotic area showed high correlations among each others, while under greenhouse condition lesion size, sporulation, percent defoliation, and percent necrotic area were highly correlated with each other, but lesion number was correlated only with percent defoliation. These relationships were more or less the same both when the parental means and when the data from individual plants were used in calculating the correlation coefficients. Lesion size, sporulation,

and percent defoliation in greenhouse at 20-25 days after cutting were found to be highly correlated with disease score at 80 days, lesion size, lesion number, and percent necrotic area in the field when parental means were used in calculating the correlation coefficients. However, no correlation among these characters was found when the individual plants data were used in the calculation. These results indicated that lesion size, sporulation, and percent defoliation in the greenhouse could be used in evaluating field resistance to black leafspot if the average of several plants was used.