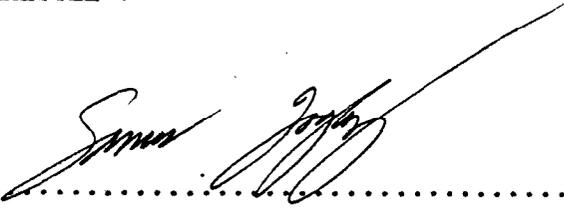
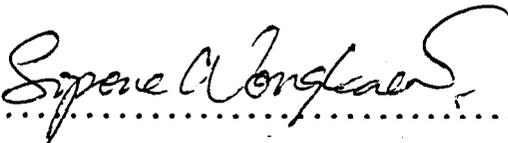


THESIS TITLE : INHERITANCES OF LATE LEAFSPOT AND RUST RESISTANCE
AND AGRONOMIC TRAITS IN PEANUT. (*Arachis hypogaea* L.)

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ABSTRACT

The objectives of this study were (1) to estimate gene actions on resistances to late leafspot and rust and on agronomic traits, (2) to identify the best parents for resistances to late leafspot and rust and agronomic traits, (3) to estimate broad sense heritabilities for components of resistances to late leafspot and rust and for agronomic traits, and (4) to determine correlations among components of resistances to late leafspot and rust and agronomic traits. Six peanut cultivars including GP-NC 343, NC 9, Lampang, NC 17135, Tainan 9 and Chico were crossed in a half diallel mating design. Three of these crosses (GP-NC 343 x

NC 17135, GP-NC 343 x Tainan 9 and NC 17135 x Tainan 9) and their corresponding backcrosses to female and male parents were used for generation mean analysis. The related generations were evaluated in the rainy season of 1989 at Khon Kaen University.

Estimation of gene actions for the components of resistances to late leafspot and rust and for agronomic traits by generation means analyses indicated that additive and dominance gene effects were important for most characters. Additive effects were more important for certain disease resistant components, i.e. disease scores at 80 days for late leafspot and rust, and number of lesions/100 cm² for rust. Important epistasis was indicated for pod weight and seed weight/plant, and additive-by-dominance was the major type of epistasis.

The results from diallel analyses also indicated the importance of additive gene action for most characters. However, for spore production of late leafspot and for pod weight and seed weight per plant, additive and non-additive gene effects were equally important. Non-additive gene effect was more important only in percent of ruptured pustules of rust. These and the results from generation mean analyses suggested that field score at 80 days and spore production were most effective in late leafspot resistance evaluation, while field score at 80 days and number of lesions/100 cm² were most effective in evaluation of rust resistance. The best parents for resistance to late leafspot were GP-NC 343 and NC 9, while NC 17135 and NC 9 were the best parents for rust resistance, and Lampang was the best parent for yield character.

Heritability estimates were generally low for all components of resistances to both diseases, suggesting that selection in early generation based on phenotype of individual plants would be ineffective. The same results were found in most of the agronomic traits except shelling percentage and pod length which showed higher heritabilities than other traits.

Almost all the characters of both disease resistances and agronomic traits showed low correlations among each others, but pod weight and seed weight per plant and number of pods per plant were found to be closely correlated. Components of resistances to late leafspot and rust were not correlated with all agronomic traits, indicating that it is possible to select for both disease resistances and desirable agronomic traits.