

## **Validation and Utilization of SNP Markers for Introgression of Late Leaf Spots Resistance Genes in Peanut**

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Late leaf spots disease (LLS) causes over 70% yield loss to peanuts in Ghana by reducing plant area available for photosynthesis. Host-plant resistance offers a safe and efficient way in controlling LLS. Molecular markers such as Single Nucleotide Polymorphism (SNP) markers promote selection efficiency and genetic gain in breeding. Four SNP markers have been proposed by INTERTEK Laboratory, Sweden but have not been validated in West Africa. The most popular variety of peanut in Ghana known as 'Shitauchi' is susceptible to LLS and needs to be improved. The objective of this research was to validate four SNP markers for identification of LLS resistant plants. A total of 150 F<sub>2</sub> seeds were generated from hybridization of LLS resistant 'CS16' variety and susceptible 'Shitauchi' variety. A small portion of seed cotyledon was sampled from each of the 150 F<sub>2</sub> seeds and genotyped with four SNP markers at INTERTEK laboratory in Sweden. The F<sub>2</sub> generation seeds were planted in pots and inoculated with conidia suspension of *Phaeoisariopsis personata* (causal agent of LLS). A 9-point rating scale was used to phenotypically screen the F<sub>2</sub> plants. SNP marker GKAMA02GL779 was not polymorphic, indicating it could not distinguish between the resistant and susceptible parents. The other 3 markers were polymorphic. SNP markers GKAMA02GL582, GKAMA02GL975 and GKAMA02GL829 had R<sup>2</sup> values greater than 0.5 which indicates strong effects of the markers on LLS suggesting that these markers can be used effectively in early generation selections for LLS resistance. Availability of validated SNP markers have enabled accelerated introgression of LLS resistance genes into a susceptible variety of peanut. Three out of the 4 proposed markers for LLS resistance breeding have been validated and can be used to aid the introgression of LLS resistance genes in a marker assisted backcross breeding program