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GENOME WIDE ASSOCIATION MAPPING FOR IDENTIFICATION OF RESISTANCE TO WHITE MOLD IN SOYBEAN. A.C.O. MESQUITA¹; A.A. FIGUEIRÓ¹; S.J. CLOUGH^{2,3}; F.C. JULIATTI¹. ¹Universidade Federal de Uberlândia, Uberlândia, Brasil / ²University of Illinois, Urbana, USA / ³USDA-ARS. E-mail: anacarolinaufu@hotmail.com

White mold is a disease of great importance in Brazil. Selection for white mold resistance would be greatly facilitated by the use of molecular markers and the discovery of genes involved with the disease. Soybean do not have complete resistance, but instead have differing levels of partial resistance that could be successful in slowing disease progression enough to allow the plants to recover, especially if the environment favors more the plant and less the pathogen. Molecular markers of the SNP type were identified from soybean genotypes, with the purpose of associating molecular markers with the resistance to fungus *S. sclerotiorum* in the wide genome by the GBS technique. We collected soybean genotypes reported as partially resistant to disease, as well as many from three different breeding programs in Brazil. We inoculated the plants with the isolate Jataí at the V2 stage using the straw test method and scored disease progress down the plant stems at four days post inoculation. Prior to inoculation, the plant DNA was extracted and fragmented by restriction digestion using HindIII and MseI and converted to barcoded genotyping-by-sequencing libraries prior to Illumina sequencing. After sequence cleaning, reads were aligned allowing the identification of 50,000 single nucleotide polymorphisms. Samples were further cleaned to reduce highly heterozygous genotypes or SNPs generating 324 genotypes and 49,000 SNPs to use in GAPIT for a genome wide association study for SNPs associated with varying levels of SSR resistance. We identified eight SNPs at FDR p-value <0.05. Seven of the SNPs were on chromosome 1, and four of these were in linkage disequilibrium, meaning that these seven SNPs represented four QTL. The last SNP was on chromosome 12. The SNPs provide possible markers that could be used in selection of soybean with enhanced resistance to *Sclerotinia sclerotiorum*.

Keywords: Screening; Genotype-by-sequencing; SNP; Marker; *Sclerotinia sclerotiorum*