

Combining ability and heritability of soybean resistance to groundnut leaf miner

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Received: 18 March 2018 / Accepted: 25 September 2018 / Published online: 28 September 2018
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Abstract Groundnut leaf miner (GLM) (*Aproaerema modicella*) (Deventer) is one of the most destructive pests of soybean and groundnuts. In this study, the mode of inheritance, general combining ability (GCA), specific combining ability (SCA) effects, maternal effects of resistance to GLM and grain yield ha^{-1} were determined. Thirteen soybean parental genotypes and 81 F_2 populations were evaluated for resistance to GLM in a 5×19 alpha lattice diallel design with two replications under natural GLM infestation in northern (Arua) and eastern (Iki-iki) Uganda during September to

December 2016 rainy season. Highly significant differences were observed among parental genotypes and F_2 populations for GLM incidence, severity, and grain yield. The estimates of GCA effects were significant for GLM incidence and severity scores but not for the number of larvae per plant and grain yield ha^{-1} . SCA effects were non-significant for all the studied traits, suggesting that GCA effects were the major component responsible for soybean resistance to GLM with additive gene effects being more important for these traits. Baker's ratio ranged from 0.44–1.0 for most of resistant traits except number of larvae per plant and grain yield ha^{-1} . The results indicated also that cultivars Maksoy1 N, PI615437, PI578457A and NIIGC4.1-2 were good combiners against GLM incidence and severity. Parent PI615437 was a good combiner for grain yield and Maksoy1 N $\times$ PI615437 was a superior cross for grain yield and against GLM incidence. There were no maternal effects for the inheritance of resistance to GLM. The study provides a basis for understanding patterns of inheritance of soybean resistance to groundnut leaf miner for an efficient breeding program.

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Keywords Additive gene effects · Diallel analysis ·
Incidence · Severity · *Aproaerema modicella*