GENERATION MEAN ANALYSIS FOR STEM RUST *(PUCCINIA GRAMINIS F. SP. TRITICI)* RESISTANCE IN WHEAT (*TRITICUM AESTIVUM L.*) IN KENYA

H. W. Gitonga[1], P. P. O. Ojwang[2] and G. K. Macharia[3]
[1,2]Egerton University, Njoro, Kenya
[3]Food Crop Research Center, Kenya Agricultural and Livestock Research Organization, Njoro, Kenya
Email: *hellenwairimu@gmail.com*

Abstract
Stem rust (*Puccinia graminis f. sp. tritici*) is a major disease of wheat (*Triticum aestivum* L.) worldwide. Understanding the gene action controlling stem rust resistance is important in breeding for resistance. The objective of this study was to determine the gene action and heritability of stem rust resistance in wheat. Two wheat genotypes, AR24 and UR108, resistant to stem rust were crossed with susceptible genotype, Cacuke, to develop six basic generations for the study of gene action involved in stem rust resistance. The Final Disease Severity (FDS) and the Area Under Disease Progress Curve (AUDPC) were used to study the gene action. The generation mean analysis in the six generations, P1, P2, F1, F2, BC1, and BC2, revealed that stem rust resistance is controlled by additive gene, partial and complete dominance. The additive effects were high and significant in AR24 × Cacuke and UR108 × Cacuke with 36.87 and 38.53, respectively for FDS. Furthermore, the additive effects were high for AUDPC with 331.40 and 428.70 in AR24 × Cacuke and UR108 × Cacuke respectively, signifying their importance in stem rust resistance. The results further indicated that stem rust resistance trait was highly heritable with narrow sense heritability values ranging from 59% to 79%. The presence of additive gene effects will potentially enhance progress to selection for stem rust in the breeding programme. Further, resistant parents can be used as donor parent in breeding for resistance to stem rust.

Key words: Stem rust, wheat, generation mean analysis, additive effect