

Abstract

Stem rust (*Puccinia graminis* f. sp. *tritici*) is a destructive disease of wheat (*Triticum aestivum* L.) making it a major challenge to wheat production in Kenya as well as other wheat growing countries. Due to this, mutation breeding has been as a source of increasing variability and confers specific improvement to the Kenyan varieties without significantly altering its phenotype. The objective of this study was to determine adult plant resistance of wheat mutant lines to stem rust across three different locations. The study area was in three locations, Nakuru County (Njoro and Mau Narok) and Meru County (Timau) during 2015-2016 cropping season. Sixty three mutant lines and six checks (NJBWII, Duma and Kwale, Kingbird, Robin and Cacuke) were evaluated under field conditions with three replications in an alpha lattice (23 rows by 3 columns) design. Mean for area under disease progress curve and coefficient of infection revealed that Duma200gry (1026), Duma200gry (1124) were best disease performers. The calculated variance (S_i) distinguished stable genotypes in terms of disease and yield which included Duma100gry (995) and Kwale100gry (1483), respectively. There was positive effect of dosage 400gry on the mutant lines in terms of disease, yield and 1000 kernel weight, mostly with the Duma mutant lines. The mean grain yield for the genotypes ranged from 5.5 to 14.1 t ha⁻¹. Genotype, location and genotype by location interaction for the area under disease progress curve, coefficient of infection and yield were significant at $P < 0.01$ and $P < 0.001$. There was a negative correlation displayed between yield and disease components. R-Square values revealed 0.1508 and 0.3911 of the variation in yield was contributed by the disease severity and area under disease progress curve, respectively. Considering the best lines both in disease and yield can be taken for further screening in breeding programmes.

Keywords

Adult Plant Resistance, Multi-locations, Stem Rust, Wheat