Abstract

Maize is a very important staple crop which helps to avert hunger and famine in sub-Saharan Africa. However, the current maize production does not meet the current consumption given the increased global population. The grey leaf spot disease (GLS) threatens maize production. A full diallel among seven inbred lines was made to identify maize lines with superior grain yield and high GLS resistance. The single cross hybrids were grown in a randomized complete block design in three replicates at three sites namely; Kenya Agricultural Research Institute (KARI), Kiboko and Kakamega; and at the University of Nairobi, Upper Kabete Campus, Field station. There was natural GLS infection at KARI, Kakamega whereas artificial inoculation was used at the Upper Kabete field station. The data on grain yield, grey leaf spot disease and other agronomic traits was analysed following the Griffing's method one model one of the SAS program to obtain the general combining ability (GCA) and specific combining ability (SCA). The inbred lines showed significant variation in reference to their GCA and SCA effects. The inbred lines, CML 384 and CML 373 were the best combiners for grain yield with GCA effects of 0.79 and 0.56 respectively while TZMI 711 and CML 373 were the most GLS resistant parents with GCA values of -0.51 and -0.398 respectively. The local maize breeders could now incorporate into recurrent and back cross recovery programs the genes for GLS resistance in CML 373 and TZMI 711 and the grain yield genes in CML 384 to help bridge the gap between researchers' and farmers' field maize yield. This will ensure food and nutritional security especially in sub Saharan Africa which is faced with chronic malnutrition and famine.