

ABSTRACT

Maize (*Zea mays*) is a staple food grown in almost all agro-ecological zones in Kenya. The production output is very low (2.4 million tons annually) nationally. Nyanza region contributes about 5 million bags. This is not enough to feed its population of 5 million people. Maize ear rot disease contributes to low maize productivity in Nyanza, with annual losses due to ear rot estimated at 18 percent. These pathogens are reported to lower the quality of the maize crop and produce mycotoxins, which are toxic to both livestock and human. *Stenocarpella spp.* is a major constraint to maize production in the mid altitude to lowland areas in Kenya. There is need for documented information of incidences and severity of ear rot causing pathogens in Nyanza Kenya. There are a few maize hybrids known to be resistant to ear rot causing fungi in other regions of the world. The hybrids grown in Kenya need to be evaluated for ear rot resistance. The objectives of this study were to survey and determine the severity and incidence of maize causing pathogens in Nyanza regions, to identify *Stenocarpella spp* causing ear rots in Maseno, and to evaluate the response of selected maize hybrids to *Stenocarpella spp.* The study was carried out in 12 Divisions of Nyanza region in successive short rain (September to December 2008) and long rain (February to July 2009) seasons. Stratified Random Sampling design (SRSD) was used, with the four counties representing a stratum. where, five farmers were selected from each stratum. The 'X' sampling technique was used for maize sample collection in the fields of farmers within the divisions whereby, the samples were randomly collected along the 'X' like structured demarcation in fields. A field was sampled 100 times to avoid biasness. Farmer's were located at 5 km apart, and then experiment repeated in Maseno area. Cobs with ear rots were examined microscopically based on spore and mycelia features from isolated fungal cultures using the International Maize and Wheat improvement Center (CIMMYT) in order to approve them as *Stenocarpella*, *Giberella*, *Fusarium*, and *Nigrosora*. Field experiments on hybrid performance against *Stenocarpella spp.* were carried out in Maseno University Research farm, during short rains and long rains of 2008 and 2009 respectively. Nine maize hybrids (EH10, H614D, P323, EH15, EH14, H516, EH13, EH16 and H515) were evaluated in a Randomised Complete Block Design with three replications. These were inoculated artificially with *Stenocarpella spp.* Three replications were used in Randomised Complete Block Design. Severity and disease incidences were subjected to ANOVA after which the means separated using Fisher's LSD. *Stenocarpella spp*, *Giberella spp*, *Fusarium spp* and *Nigrosora spp* were isolated and identified using identification keys as ear rot causing pathogens. Their prevalence being only higher during long rains seasons than in the short rains season. There were significant differences ($\alpha=0.005$) in incidences and the severity of the ear rots with *Stenocarpella* means being highest followed by *Fusarium* as earlier suggested by other researchers. This was also observed during study in Maseno area. Based on significant differences found within regions; Sakwa, Asego and Imbo were highly affected by the Fungi. This might be due to their adjacent locations dictating similar close environment and similar farming technique by farmers. The 9 hybrids studied had a mean severity score of 1.98. EH10, EH14, EH15, and P3253 hybrids were resistant to *Stenocarpella spp.*, and H614D, EH13, H516, H515, EHI6 hybrids susceptible to the *Stenocarpella spp.* Large number of maize hybrid that are not susceptible to ear rots should be identified and recommended to the farmers as ear rots are highly infested in farming soils of Nyanza regions.