Proceedings of the 52nd Italian Society of Agricultural Genetics Annual Congress
Padova, Italy – 14/17 September, 2008
ISBN **978-88-900622-8-5**

Poster Abstract – C.09

EVALUATION OF INOCULATION TECHNIQUES FOR *FUSARIUM VERTICILLIODES* EAR ROT INFECTION OF MAIZE*

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plant disease, resistance, Fusarium verticilliodes, fumonisins, Zea mays L.

An efficient inoculation technique for Fusarium ear rot infection of maize, must be developed for a good and reliable differentiation between genotypes. Compared with natural infection, inoculation increases disease severity and decreases variability within and among treatments. High levels of resistance identified from inoculated trials will enable breeders to develop hybrids that are useful to producers during normal growing season and during growing seasons when disease development is favoured. Entry of Fusarium into maize ears can occur: i) by silk channel (growth of mycelium down silks to the kernels and cob from spores germinating on the silks) or ii) by kernel (through wounds through the husk caused by insects or birds). Some Fusarium strains produce toxic compounds; the occurrence of mycotoxins in cereal grains is a great concern worldwide, because their presence in feed and foods is often associated with chronic or acute mycotoxicoses in livestock and also in humans.

The proposed research is focused on the screening of maize genotypes for resistance to *Fusarium verticillioides*, fungal pathogen which attacks maize, causing root, stalk and ear rot diseases, producing fumonisins. The objective of this study is to identify an inoculation technique that is suitable for an efficient evaluation of a large number of maize genotypes for resistance to Fusarium ear rot and fumonisins in grain. For this purpose, two inoculation techniques were developed, one to screen for resistance to infection via the silk and one to screen for resistance to infection via kernel wounds. During 2007, 33 different maize genotypes (commercial hybrids) were used as experimental material and tested in four Northern Italy locations for *F. verticillioides* resistance, by means of three separated artificial inoculation methods applied to each primary ear: i) the non-wounding Silk Channel Inoculation Assay (SCIA)-SPRAY technique, ii) the wounding SCIA-SYRINGE technique and iii) the Kernel Inoculation method. The test included: i) self pollinated non–inoculated ears, ii) self-pollinated inoculated ears, iii) open-pollinated non inoculated ears, iv) open-pollinated inoculated ears. At pollination, silk channel (region within the husk between the tip of the cob and tip of the husk where the silks emerge) length was recorded for each maize genotype. At maturity, ears were manually harvested. For husk cover visual rating ranging from 1 (good tight long husks extending beyond the tip of the ear) to 5 (poor:loose short husks with exposed ear tips) were recorded. After hand de-husking; the severity of ear *F. verticilliodes* attack was evaluated using rating scales based on the percentage of kernels with visible symptoms of infection, such as rot and mycelium growth. After visual inspection ears were dried and shelled; the kernels were bulked within plots. To evaluate internal kernel infection 50 kernels were randomly chosen from each sample, surface-disinfected, and plated on potato DRBC agar. Fumonisin content was evaluated using enzyme-immunoassay-ELISA kit. Furthermore, each

entry tested in the artificial inoculation experiments, was evaluated in field tests at different locations in Northern Italy in order to compare the response of hybrids in different environmental conditions.

*****Research developed in the Program MICOCER