INOCULATION TECHNIQUES FOR EVALUATING MAIZE RESISTANCE TO *FUSARIUM VERTICILLIOIDES* EAR ROT*

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*Fusarium verticillioides*, ear rot, artificial inoculation, genotype resistance, *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. Fusarium attack to maize ears can occur: i) by silks ii) by kernels. Some *Fusarium* strains produce mycotoxins which can be formed in infected plants before harvesting, or in grains during post-harvest storage. 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.

Our 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 mycotoxins (fumonisins).

During 2007, 33 maize genotypes (commercial hybrids) were tested in field experiments in various Northern Italy locations through 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 length was recorded. At maturity, ears were manually harvested; husk cover visual ratings 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.

The severity of *F. verticillioides* attack was evaluated using ratings based on the percentage of kernels with visible symptoms of infection. 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.

The non-wounding Silk Channel Inoculation Assay (SCIA)-SPRAY technique applied during 2007 was not efficient to evaluate maize commercial hybrids response to *F. verticillioides* attack, so during 2008, the 33 hybrids were tested in various locations by i) the wounding SCIA-SYRINGE technique and ii) the Kernel Inoculation method.

Variability in the response to Fusarium attack was evident after visual evaluation of the maize genotypes tested in field experiments through different artificial inoculation methods. The evaluation of symptomless infections result important for the final interpretation of data.

*Research developed in the Program MICOCER