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Poster Abstract – A.50

SCREENING OF MAIZE GENOTYPES FOR RESISTANCE TO *ASPERGILLUS FLAVUS**

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The fungus *Aspergillus flavus* is responsible for both pre- and post-harvest accumulation of aflatoxin in maize (*Zea mays* L). Concern about aflatoxin contamination is due to its potent potential carcinogenicity.

In maize, resistance against *A.flavus* infection and aflatoxin accumulation is a complex trait that is influenced by genotype, agronomic practics and environamental conditions. Beneficial secondary traits such as husk covering and tightness, physical properties of the pericarp, and drought or heat stress tolerance are factors contributing to aflatoxin resistance.

The availability of reliable methods for the screening and evaluation of maize genotypes for improving tolerance to *Aspergillus* attacks is an unvaluable tool in breeding programmes to increase crop protections against fungal infection. The aim of our research is to evaluate and compare 34 maize hybrids for *A. flavus* resistance and for aflatoxin accumulation under field condition. The test included: i)self pollinated non–inoculated ears, ii)self-pollinated inoculated (*A.flavus*) ears. iii)open-pollinated non inoculated ears (in 10-20 different locations)- The inoculation experiment was replicated at two different planting dates. 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 genotype.

Ten per plot hand pollinated plants were inoculated with a fresh spore suspension (mixture of five *A.flavus* isolates from Northern Italy), 7 days after pollination by the non-wounding silk channel inoculation technique applied to each primary ear. Controls were non-inoculated and sterile water-inoculated plants. 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) has been recorded. After hand de-husking; the severity of ear *A. flavus* attack was evaluated using rating scales based on the percentage of kernels with visible symptoms of infection, such as rot and mycelium growth(Disease Severity Rating-DSR-:from1=0%-no infection to 7=76-100% of visibly infected kernels/ear). Inoculated materials showed a higher DSR in comparison to control or open-pollinated non-inoculated plants, that did not show any or very low disease symptoms. This result indicates that the non-wounding silk channel inoculation technique applied was effective in inducing *A.flavus* attack. In addition, variability in the response of the maize genotypes tested to *Aspergillus* attack has been shown. After visual inspection ears were dried and shelled. The kernels were bulked within plots. To evaluate internal kernel infection fifty kernels were randomly chosen from each sample, were surface-disinfected and plated on potato PCNB agar.

Content of Aflatoxin B1 in the control, inoculated and open-pollinated non inoculated materials, has been evaluated using enzyme-immunoassay-ELISA kit. The aflatoxin content in the inoculated ears resulted higher than in the controls and in the open-pollinated non inoculated materials;.this indication confirm that the *A.flavus* isolates used for the inoculum procedure were successful in accumulating mycotoxin in grains. Also in this case variability has been found between the genotypes under tested.

Correlations between visual ear rot ratings, internal kernel infection evaluation, aflatoxin content, silk channel length at pollination, husk cover ratings, are in progress.

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