B-73 Effect of field conditions on the pre-harvest contamination of aflatoxin producing organisms in Maize during Yala 96 and Maha 96/97

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Aflatoxin contamination of maize cob during pre-harvest has been reported. Cropping pattern, season and environmental conditions are favourable for effecting the toxin producing organisms, *Aspergillus flavus / parasiticis.* Sclerotium germination is found to occur in maize fields prior to silking.

The study reports on (a) aerial microflora associated with per-harvest conditions (b) effect of seed treatment with fungicide as a control measure of contaminated seeds used for planting.

Maize (Aruna variety) was cultivated in Randomized Complete Block Designed plots (5 x 4 sq.m) with/without seed treatment with Captan (3g/kg), during both Yala 96 and Maha 96/97 at the FCRDI, Maha Illuppallama. The agronomic conditions were that defined by the Department of Agriculture. Associated aerial microflora were quantified weekly, starting from the 13th day of flowering by subjecting aerial pegs to different locations for 15 h on the field. The slides were examined under a light microscope (x 40) and spore count of 3 replicates were reported.

The presence of *Aspergillus flavus / parasiticus* in plant parts, aerial pegs and soil were detected by AFPA Selective Media, specific for these 2 organisms. Aflatoxin content was quantified by HPLC techniques (Waters 510, solvent delivery system, Column - Micro Bond Pak C^{18}, Pressure:1000 psi, Fluorescence detector-SPD 10 AC, excitation wavelength: 365 nm, emission wavelength 455 nm).

The investigations revealed that: (a) Microflora associated with maize were (spore count): *Phomopsis* spp. 132 and 664, *Aspergillus* spp. 11 and 10, *Fusarium* spp. 23 and 41 *Tolysporium* spp. 30 and 236, *Mucor* spp. 34 and 35 *Botrytis* spp. 3 and 0, for Yala and Maha seasons, respectively. The *Aspergillus* strains observed under the Electron microscope were found to be *A. niger* and an unidentified *Aspergillus* spp. both non-toxic types. (b) Seeds/cobs harvested from the untreated plots showed the presence of *Aspergillus flavus/parasiticus.* Aflatoxin was present only in 2 of these cobs. (67 to 82 ng/kg). The absence of these 2 organisms in treated seeds/cobs, and in soil pegs (both treated and untreated plots) were noted. However, *A. flavus/parasitiicus* was detected in the inflorescense of the treated and untreated plants after harvesting (after 40 day of flowering).

This study concludes that (a) aflatoxin contamination of maize seeds in Sri Lanka is more favourable towards post-harvest related conditions than pre-harvest. (b) Field contamination seemed to occur close to time of harvest (approximately at 40th day after flowering). (c) Treatment with fungicide was an effective method for controlling the growth of the organism during pre-harvest.