B-72 Influence of relative humidity and inital moisture content on accumulation of aflatoxin in maize *seeds*

G H A C M Hettiarchchi[1], Jaanaki Gooneratne[2], W K Hirimburegama[1]
[1]Dept of Botany, University of Colombo, Colombo 3. Ceylon Institute of Scientific and Industrial Research, Colombo 7.

Aflatoxins are mycotoxins produced by *Aspergillus flavus* and *A. . parasiticus.* The presence of these toxins in locally produced maize has been reported and this contamination is a potential hazard to public health.

The present study was done to investigate the effect of initial moisture content of seeds and environmental Relative Humidity (RH) on the growth of above *Aspergillus* species and accumulation of aflatoxin in maize seeds.

Seeds were inoculated with a known quantity of (50:50) standard cultures of *A. flavus* (ATCC 15517) and *A . parasiticus* (ATCC 28285). One set of seeds was surface damaged with a needle. The following 2 experiments were conducted: (a) seeds with initial moisture content of 10.5% and 13.5% (wet basis) were subjected to RH 70%, 30 °C, for 4 weeks, (b) seeds equilibrated at 60% RH to initial moisture content of 10.5%. (wet basis) were subjected to RH 70%, 80% and 90%, 30 °C, for a period of 4 weeks. The growth of the organism and accumulation of aflatoxin were quantified by spread plate method and HPLC techniques respectively.

Results show that, (a) Seeds kept at 10.5% moisture level showed no fungal growth at 70% RH., for both damaged and undamaged seeds. At 13.5% a growth of 3 to 5 CFU/10 g for intact and damaged seeds was reported, respectively. The accumulation of aflatoxin was higher in damaged seeds (4.6>39.5 ng/g) which was statistically significant ($\alpha = 0.5$) (b) Seeds kept at 80% RH showed fungal growth and produced aflatoxin after 4 weeks. Levels were 160 ng/g and 55 ng/g for damaged and intact seeds, respectively. At 90% RH, high aflatoxin levels were found in both damaged and undamaged seeds (50.0 and 44.2 ng/g) at end of 2 weeks, but the differences were not statistically significant.

Considering all the results, maize seeds should be dried to moisture levels lower than 11.3% (wet basis) for long term storage under local conditions to prevent contamination with aflatoxin. Damage to seeds should be avoided.

Financial assistance by Council for Agricultural Research Policy (Research grant CARP 12/315/238) is acknowledged.