

OCCURRENCE OF *FUSARIUM* SPECIES IN AFLASAFE TREATED MAIZE FIELDS IN LOWER EASTERN KENYA

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INTRODUCTION

- Maize (*Zea mays* L.) is highly susceptible to infection by *Fusarium* species resulting in maize ear rot disease (Fig. 1) and contamination with fumonisin (Wagacha and Muthomi, 2008).
- The crop is often co-infected by *Fusarium* and *Aspergillus* spp.
- Aflasafe KE01 is a bio-pesticide consisting of four atoxigenic strains of *Aspergillus flavus* L strain native to Kenyan soils and is currently being tested for control of toxigenic *Aspergillus* species.
- No studies have been carried out to investigate whether aflasafe KE01 has efficacious effect on *Fusarium* species.

OBJECTIVE

To determine the incidence of *Fusarium* species in maize from aflasafe KE01 treated fields in lower eastern Kenya.

RESULTS

- There was co-occurrence of *Fusarium* and *Aspergillus* spp. in maize samples (Fig. 2).
- Diverse species of *Fusarium* were isolated from ground maize grain samples (Fig. 3)
- The population of *Fusarium* spp. in maize samples from treated fields in Machakos and Kitui Counties was significantly ($p = 0.042$) lower than from non-treated fields (Fig. 4).
- F. oxysporum* and *F. verticillioides* were isolated in the highest incidence in maize samples (Fig. 5).

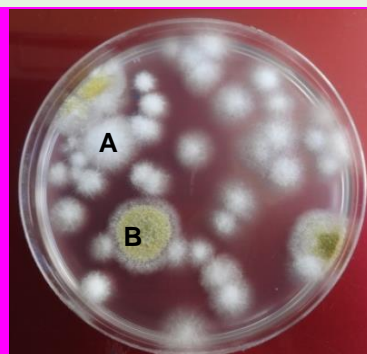


Fig. 2: Colonies of *Fusarium* (A) and *Aspergillus* (B) species isolated from a maize sample

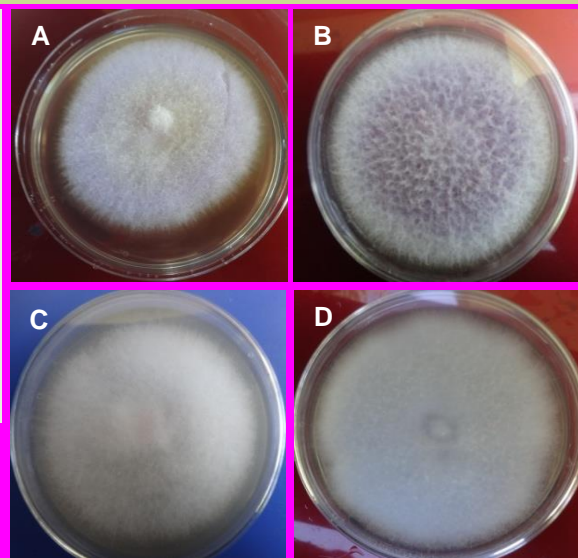


Fig. 3: Culture plates of major *Fusarium* species isolated from maize kernels. *Fusarium oxysporum* (A), *F. verticillioides* (B), *F. longipes* (C) and *F. proliferatum* (D)



Fig 1: Maize ear rot disease caused by *Fusarium* species.

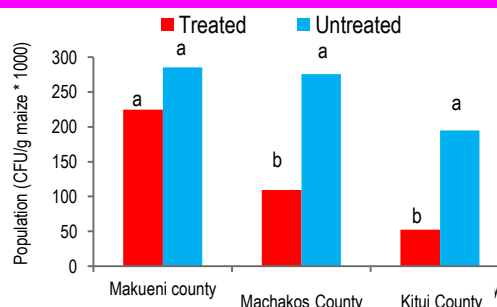


Fig. 4: Population (CFU/g x 1000) of major *Fusarium* species in ground maize sampled at harvest from aflasafe KE01 treated and untreated fields in lower eastern Kenya. Different letters (a) and (b) on adjacent bars indicate significant difference at $p=0.05$ in treated and untreated field.

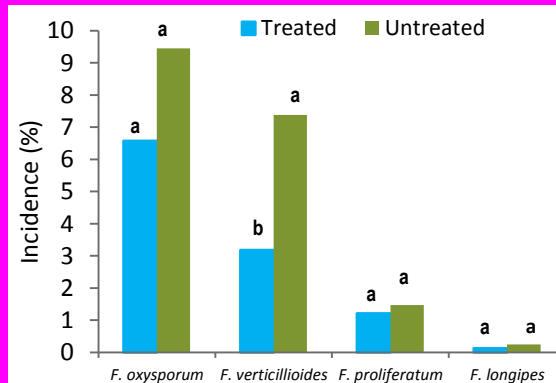


Fig.5: Incidence (%) of major *Fusarium* species in maize grains sampled at harvest from aflasafe KE01 treated and untreated fields in lower eastern Kenya. Different letters (a) and (b) on adjacent bars indicate significant difference at $p=0.05$ in treated and untreated field.

MATERIAL AND METHODS

- Maize cobs were sampled at harvest from 135 farmer's fields in Makenuei, Machakos and Kitui Counties in lower eastern Kenya during the 2013/2014 cropping season.
- Aflasafe KE01 was applied by broadcasting at the rate of 10 Kg/Ha two to three weeks before flowering.
- The maize was manually shelled, dried to $\leq 13\%$ moisture content and ground.
- The samples were serially diluted and plated in low strength PDA amended with salts and antimicrobial agents.
- Fusarium* species were sub-cultured on PDA and Spezieller Nährstoffarmer Agar (SNA) and identified based on cultural and morphological characteristics.

DISCUSSION

- Preliminary findings indicated that aflasafe KE01 has some activity (albeit limited) on the population and incidence of *Fusarium* species.
- Maize from the three Counties was co-infected with *Fusarium* and *Aspergillus* species – both of which produce mycotoxins - implying a risk of contamination of maize with multiple toxins.
- Isolation of *F. verticillioides* and *F. proliferatum* in high incidence from the maize samples implies a potential risk of contamination of the maize with fumonisin.

REFERENCES

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