ABSTRACT

Consumption of maize contaminated with mycotoxins has been associated with detrimental health effects. A farm survey covering 116 push-pull and 139 non-push-pull cropping systems was conducted to determine the socio-economic and agronomic factors that influence farmers' knowledge on incidence and contamination of maize by ear rots and associated mycotoxins in western Kenya. All the respondents were smallholder farmers between the ages of 23 and 80 years, with 50% of them being female. Maize samples were collected from the standing crop in the field of each interviewed farmer and analyzed for aflatoxin and fumonisin. Only a small proportion of farmers had knowledge of aflatoxin and ear rots in maize. Overall, less than 20% of maize samples were contaminated with both aflatoxin and fumonisin, and more maize samples were contaminated with fumonisin as compared to aflatoxin. Proportions of maize samples containing higher than the acceptable Kenyan regulatory threshold (10 μg/kg) for aflatoxin and European Commission regulatory threshold (1,000) μg/kg for fumonisin were lower in maize samples from push-pull cropping system. Age of farmer and county of residence were significantly and positively associated with knowledge of aflatoxin, while cropping system, county of residence, and level of education were positively associated with knowledge of maize ear rots. There was strong correlation between knowledge of maize ear rots and knowledge of aflatoxin. Levels of both aflatoxin and fumonisin were significantly and positively associated with the use of diammonium phosphate (DAP) fertilizer at planting. Aflatoxin levels were also positively associated with stemborer damage. Agronomic practices were not significantly different between push-pull and non-push-pull farmers. However, use of DAP fertilizer was the most important agronomic factor since it was associated with both aflatoxin and fumonisin contamination of maize. These results imply that creating awareness is key to mitigation of ear rots and mycotoxin contamination of maize. The results also suggest that the levels of aflatoxin and fumonisin in maize in western Kenya were influenced both by pre-harvest agronomic practices and by the cropping system adopted, push-pull or not.