

## Moisture Content, Insect Pests, Mycotoxin Levels in Maize in Three Districts in the Middle Belt of Ghana

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**ABSTRACT** Globally, insect pest infestation and mycotoxin contamination of maize threatens food safety and security and contribute to low farm income especially, in the tropics where maize is a staple. However, knowledge of factors such as moisture content and environmental conditions that facilitate insect pest infestation and mycotoxin contamination is paramount to reducing maize post-harvest losses to guarantee food security and improve health and economic wellbeing of actors along the maize value chain. This study focused on post-harvest loss of maize by assessing grain moisture content, insect pests, and aflatoxin and fumonisin levels of maize on-farm at three varying stages — field, heaping and post-drying stages — during the major and minor cropping seasons in the middle belt of Ghana. Data showed that maize moisture content decreased significantly from the field stage (17.2–19.0%) to the post-drying stage (12.4–14.2%). The mean grain moisture content was significantly higher in the major season (20.4%) than minor season (12.5%). *Sitophilus zeamais* Motschulsky, *Sitotroga cerealella* Olivier, *Cathartus quadricollis* Guerin-Meneville and *Carpophilus dimidiatus* Fabricius were the dominant insect species that attacked maize on-farm in the middle belt of Ghana. Mean numbers of insects were significantly higher in the minor season than the major season, but in both seasons, higher numbers of insects were detected at the heaping stage (9.9 per 500 g) compared to the field and post-drying stage ( $\leq 7.5$  per 500 g). Nonetheless, insect damaged kernels (IDK), % IDK and % weight loss were significantly lower at the field stage than at both the heaping and post-drying stages. Mean aflatoxin (ppb) and fumonisin (ppm) levels were significantly higher in the major season (29.1 ppb, 1.6 ppm) compared to the minor season (3.5 ppb, 1.0 ppm).

**KEY WORDS** Insect pests, aflatoxin, fumonisin, maize post-harvest losses, food security