INFLUENCE OF BT TRAITS ON MYCOTOXIN LEVELS IN CORN

E. Zuchelli
R. Guyer
H. M. Kelly
S. D. Stewart
Department of Entomology and Plant Pathology
The University of Tennessee
Jackson, TN

Abstract

Occurrence of *Aspergillus flavus* and *Fusarium* spp in corn can lead to the production of Aflatoxin (AFL) and Fumonisin (FMS) respectively. Pathogens can infect ears through wounds made by insects and followed by conducive environmental conditions disease and mycotoxins can develop. Disease management includes using corn hybrids that are less susceptible to disease, avoiding plant stress by managing sowing date and location, and controling insect damage by spraying insecticides or using Bt traits. This research evaluated the association of different Bt traits (Cry and Vip), compared to non Bt traits (control), planting date, and location on AFL and FMS. Sister lines of Dekalb DKC66-94 and Pioneer P1637 were evaluated in a randomized complete block design with four replicates. P1637 hybrid was planted at two locations (Milan and Jackson) and two planting dates (April vs. May). Corn earworm, *Helicoverpa zea*, infestations were low during the 2019 season. Damaged ears (%) ranged from 5 to 35% in non Bt controls, but much of this ear feeding damage was caused by southwestern corn borer, *Diatraea grandiosella*, which wounded the base of the ear, *while corn earworm damage* was mostly confined to the tips ears. Positive correlations between AFL and FMS levels to damage at the tip and the base of the ear were found, r^2=0.3225 (p=0.0307) and r^2=0.5077 and (p=0.0004), respectively. AFL level ranged from 0 to 1.9 ppb, but no significant differences were observed across Bt traits, locations, or planting dates. FMS levels were reduced with Bt traits (Cry and Cry + Vip) at Milan. At the Jackson location, corn was not irrigated and FMS was reduced by Cry + Vip (p=0.0477). Additional research is needed to further investigate the relationship between mycotoxins and management practices.