Development of a decision support model for the management of fungal ear rot and associated mycotoxin contamination in corn grain

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Corn ear rot disease and associated mycotoxins, such as deoxynivalenol (DON), are annual issues for many Michigan corn producers. The combination of hybrid susceptibility and ideal weather conditions for fungal infection during silking can result in corn ear rot and associated DON contamination. Moreover, feeding by western bean cutworm (WBC) has been observed in hybrids, even with Bt trait for insect control (Cry 1F). Insect damage to the ear provides another pathway for fungal infection and mycotoxin contamination. In 2017 growing season, because of a different weather pattern during silking, there was an apparent decrease in ear rot occurrence in the state, compared with 2016 and 2018. This highlights the impact of weather on this problem. Fungicide application is generally practiced by corn growers and has shown to decrease DON levels and increase corn yields. However, fungicide use is expensive, and timing of application can impact the efficacy of ear rot control. Hence, producers must need accurate climate/weather forecast information to know the potential risk of disease occurrence to improve their chance of better managing this annual menace. Also, it is necessary to predict silking of common corn hybrids to better design agronomic practices that will minimize the occurrence of ear rot and associated mycotoxin contamination. Corn hybrid age groups and geographic diversity in corn-growing regions provide opportunities to design different planting windows in the state that maximize resource utilization and minimize fungal infection at silking. In this paper, we present the development of a decision support model for the prediction of risks and management of fungal ear rot and associated mycotoxins of corn grain in Michigan.

Feedback/Corrections?