DISEASES OF CORN

Evaluation of Fungicides for Diplodia Ear Rot

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Diplodia ear rot, caused by the fungus *Stenocarpella maydis*, has become an important disease across the Midwest. Since the fungus survives in crop residue, continuous corn production and minimum or reduced tillage practices may increase disease severity. Warm, humid conditions after pollination and hybrid susceptibility also influence disease levels in a given year.

This publication describes:

1. How to identify Diplodia ear rot
2. Research information about foliar fungicide efficacy for Diplodia ear rot
3. Updated disease management guidelines for Diplodia ear rot

Identification

In general, *S. maydis* colonizes ears, giving them a white, mummified appearance (Figure 1). The infected kernels are often lighter than healthy kernels, and the husk will turn brown and look dryer than the

Figure 1. White, fuzzy mold on the ear is a characteristic sign of Diplodia ear rot.

Figure 2. Husks on ears affected by Diplodia ear rot have a dry, bleached appearance compared with the rest of the plant.

Figure 3. Close up of spore-producing pycnidia, which appear as small black structures on the kernels and cob.

rest of the plant (Figure 2). Later in the season, black fungal fruiting bodies may be observed on kernels (Figure 3).

Diseases of Corn: Diplodia Ear Rot (Purdue Extension publication BP-75-W) describes disease symptoms and signs in more detail, and provides information about the disease cycle and environmental conditions that favor disease development. It is available from the Education Store, www.edustore.purdue.edu.

Research on Foliar Fungicide Efficacy

Purdue University researchers investigated fungicide efficacy for Diplodia ear rot. Trials were conducted at the Agronomy Center for Research and Education (ACRE) in Tippecanoe County, Indiana (2011-2013), and at the Southwest Purdue Agricultural Center (SWPAC), in Knox County (2012, 2013). In both locations, researchers evaluated the efficacy of two foliar fungicides: a triazole product and a strobilurin + triazole mix product.

Researchers made a single ground application of fungicide at one of three growth stages:

- V6 (six visible leaf collars)
- VT-R1 (tasselling-silking)
- R3 (early milk)

Each fungicide trial was established under conditions of low and high disease pressure. To encourage disease development, researchers conducted high disease pressure trials by inoculating test plots with a mix of isolates of the fungus that cause Diplodia ear rot. Replicated non-fungicide treated check plots were included in each trial. Researchers then evaluated disease severity (percent of ear with symptoms/signs of Diplodia ear rot) at R6 (physiological maturity) (Figure 4).

Figure 4. Ears from fungicide trials that exhibited Diplodia ear rot.

Research Findings

This research demonstrates that fungicides did not consistently reduce disease severity any more than the check plots that were not treated with fungicides under high or low disease pressure.

The researchers designed the trials to determine if application timing influenced fungicide performance. Results show inconsistent performance regardless of the growth stage at which fungicides were applied, and it appears that fungicides are not consistently effective at preventing or suppressing Diplodia ear rot (Figures 5 and 6, page 3).

It is likely that current fungicide application methods restrict the amount of fungicide that is able to penetrate the husk, and limited fungicide mobility in the plant reduces the amount of fungicide available at the point of infection. Based on evidence generated in our research, we do not recommend using foliar fungicides specifically for Diplodia ear rot control, but they remain an option for foliar disease management.

Updated Management Guidelines

General disease management guidelines for Diplodia ear rot include selecting and planting hybrids that are resistant or less susceptible to this disease. This is especially important in areas of continuous corn production or where conservation tillage is practiced. Because the Diplodia ear rot pathogen survives in residue, any reduction of corn residue through crop rotation and tillage practices can reduce the amount of inoculum available to infect subsequent corn crops.

Reference

Romero, M. P., and Wise, K.A. (2015). Timing and Efficacy of Fungicide Applications for Diplodia Ear Rot Management in Corn. Plant Health Progress doi: 10.1094/PHP-RS-15-0010.

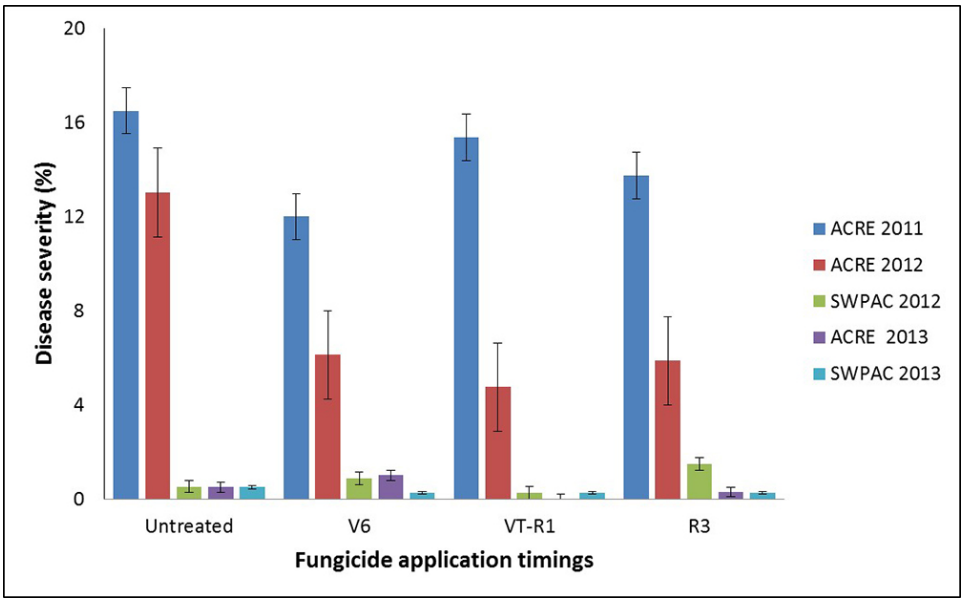

Figure 5. Impact of fungicide (QoI strobilurins + triazoles) on Diplodia ear rot under low disease pressure. Trials were conducted at the Agronomy Center for Research and Education (2011-2013) and Southwest Purdue Agricultural Center (2012-2013).

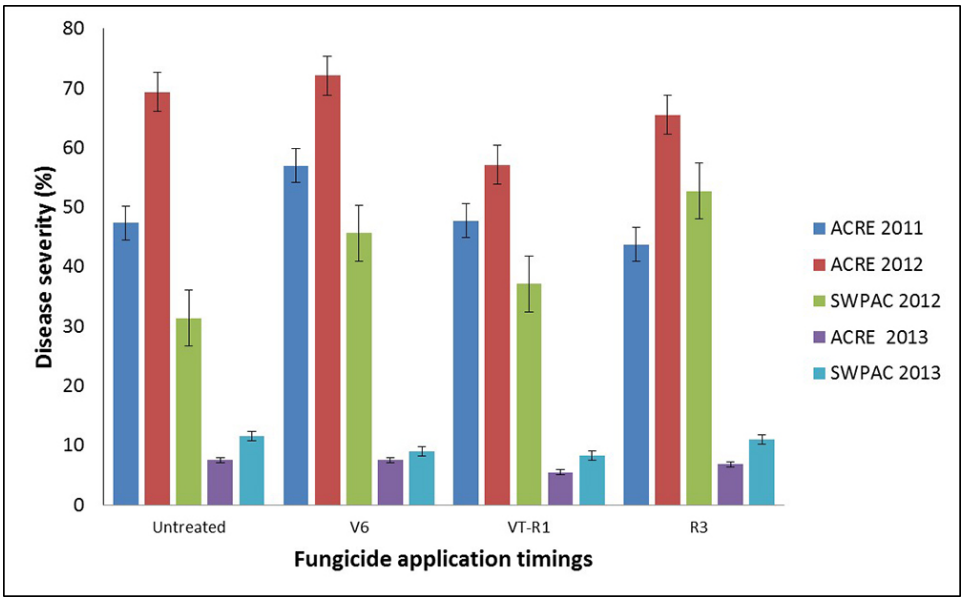

Figure 6. Impact of fungicide (QoI strobilurins + triazoles) on Diplodia ear rot under high disease pressure. Trials were conducted at the Agronomy Center for Research and Education (2011-2013) and Southwest Purdue Agricultural Center (2012-2013).

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