Virginia Cooperative Extension
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Tar Spot of Corn

Authored by Kamal Chhetri, PhD student, Southern Piedmont AREC, Virginia Tech; David Langston, Professor of Plant Pathology and Extension Specialist, Tidewater AREC, Virginia Tech; and Yuan Zeng, Assistant Professor of Plant Pathology and Extension Specialist, Southern Piedmont AREC, Virginia Tech

Introduction

Tar spot of corn, caused by the fungal pathogen *Phyllachora maydis*, is an important foliar disease in the United States. In the Midwest, yield losses of 25-30% have been documented, with some severely affected corn fields reporting up to 60 bushels per acre lost. Tar spot was first confirmed in the northern Shenandoah Valley of Virginia in 2022. Given its potential to cause significant yield losses, it is important for Extension agents and growers in Virginia to identify tar spot disease and stay informed about current management options.

Signs and Symptoms

Symptoms of tar spot include yellow to tan flecks on corn leaves, husks, or stalks. The black, glossy, raised fungal fruiting bodies (stromata) of *P. maydis* are embedded in host tissue, typically circular or oval in shape, and can appear on both upper and lower leaf surfaces (Figure 1A & B). Stromata become visible two to three weeks after infection, and a necrotic halo may develop later around the stromata, giving the appearance of a fisheye lesion (Figure 1B). In severe cases, these necrotic halos coalesce, causing leaf blight that leads to premature senescence (Figure 1A). Stromata contain both sexual spores (ascospores; Figure 1C) and asexual spores (Figure 1D), which play essential roles in pathogen dispersal and disease development. Other foliar diseases can produce similar symptoms, so laboratory confirmation is necessary for accurate diagnosis. Growers are advised to submit suspect samples to Extension Specialists or the Plant Disease Clinic at Virginia Tech for verification.

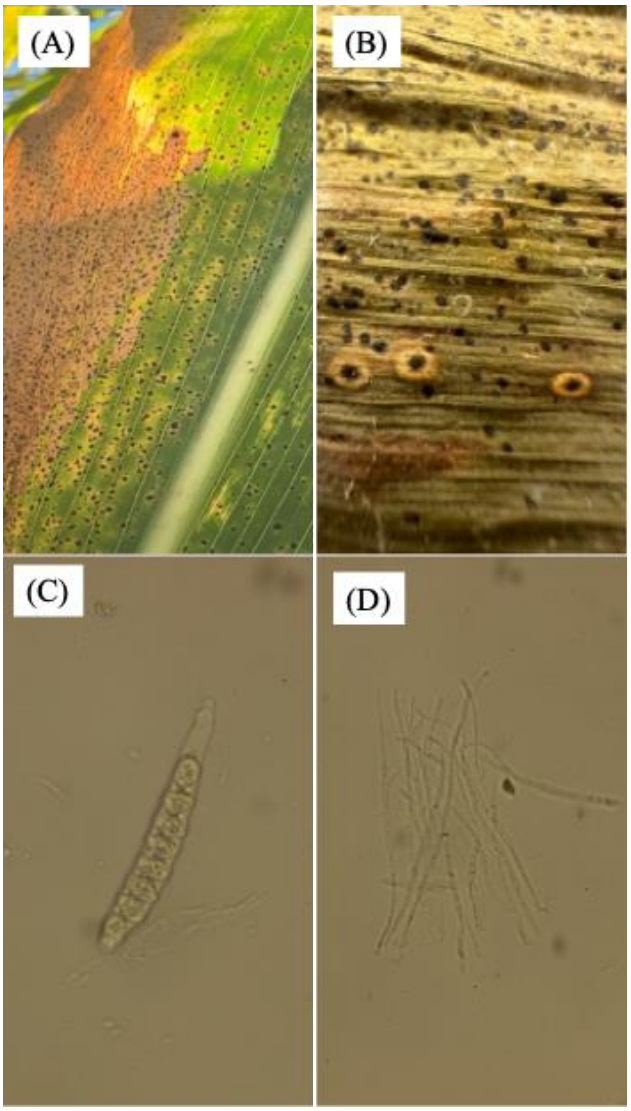

Figure 1. (A) Green leaf with stromata of *Phyllachora maydis.* Necrotic halos coalesced on the left side of the corn leaf, resulting in leaf blight. (B) Some stromata are enclosed by fisheye lesions. (C) Microscopic view of a *P. maydis* ascus with eight ascospores (400× magnification). (D) Microscopic view of *P. maydis* conidia (400× magnification). (Kamal Chhetri, Southern Piedmont AREC)

Conducive Environmental Conditions

Weather conditions, including air temperatures between 16 and 23 °C, relative humidity above 75%, greater than 7 hours of leaf wetness per night, and 10 to 20 foggy days per month, favor the release and dispersal of spores. The time from pathogen colonization to stromata development on infected tissues is usually two to three weeks.

Management Options

Current management options for tar spot of corn include fungicide applications and the use of partially tolerant corn varieties. Cultural practices, such as crop rotation and tillage, may have potential for managing tar spot.

Fungicide application

Foliar fungicide applications in corn fields at high risk for tar spot have proven to be effective in controlling the disease and protecting yield. The timing of fungicide application is also crucial, as tar spot disease appears during the later stages of corn growth.

The timing of fungicide application is vital for managing tar spot, as fungicides typically provide protection for only 14 to 21 days after application. In most years, a single application of fungicide applied between the tassel (VT) and milk (R3) growth stages of corn should be sufficient to reduce tar spot severity and optimize return on investment.

Fungicides with multiple modes of action (DMI+QoI, DMI+SDHI, or DMI+QoI+SDHI) are generally preferred over those with a single mode of action (https://cropprotectionnetwork.s3.amazonaws.com/corn-foliar-efficacy-2025.pdf). For example, plots treated with Veltyma (DMI+QoI) had significantly lower tar spot severity compared to the control in 2023 fungicide efficacy trials conducted in Shenandoah County, Virginia (Table 1). In 2024, none of the evaluated chemical fungicides showed a significant inhibitory effect on tar spot severity, although plots treated with Adastrio (DMI+QoI+SDHI) had disease levels similar to the untreated control (Table 1).

Table 1. Foliar fungicides evaluated in field trials conducted in Shenandoah County, Virginia, in 2023 and 2024. Fungicides were applied at the VT/R1 growth stage.

Product name	FRAC code#	Rate/A (fl oz)	Mean tar spot severity (%) before harvesting* 2023	2024
Adastrio	3+7+11	7.0	no data	0.2a
Fortix	3+11	4.0	no data	1.3a
Trivapro	3+7+11	13.7	0.4ab	0.4a
Veltyma	3+11	7.0	0.2a	1.5a
Xyway	3	15.2	no data	1.4a
Lucento	3+7	5.0	no data	0.6a
Quilt Xcel	11+3	14.0	0.4ab	no data
Delaro 325SC	3 + 11	8.0	0.6b	no data
Control	no data	no data	0.9b	0.2a

#: FRAC codes are given by the Fungicide Resistance Action Committee as a system to identify the active ingredient mode of action and resistance risk.
*: Different letters following the numbers indicate statistically significant differences compared to the control (i.e., plots without fungicide application).

Cultural practices

- Use of tolerant hybrids may not be an option to control tar spot. In 2023-2024, eight hybrids, including DKC59-82-109RM, DKC111-35-111RM, DKC64-22-114RM, DKC65-95-115RM, DKC65-95-115RM, DKC66-06-116RM, DKC568-35-118RM, PM1380Q, and PM1903AM, were evaluated in Shenandoah County, Virginia, and all were found to be susceptible to tar spot.
- Crop rotation and tillage may reduce local pathogen inoculum levels, as the tar spot pathogen overwinters within stromata in corn residue. However, their impact in reducing tar spot severity is likely less important than fungicide application and the use of tolerant varieties.

New Research

The Plant Pathology lab at Southern Piedmont AREC is using low-cost, solar-powered spore traps in corn fields combined with high-throughput sequencing technology to monitor corn foliar fungal pathogens and ear rot pathogens. Early detection of these pathogens before disease onset is essential, as it can help optimize fungicide application timing. Notably, through this monitoring effort, the tar spot

pathogen has already been detected in Shenandoah County, Montgomery County, and Suffolk in Virginia.

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