

Managing Corn Diseases

Introduction

Disease management is necessary to protect yield potential in any crop. In corn, integrated disease management tactics include corn product selection, crop rotation, residue management, and fungicide applications. Fungal leaf blights, stalk rots, and ear rots are the major categories of diseases affecting corn.¹ Crop scouting is the backbone for all pest management programs. Corn should be monitored for evidence of diseases during each field visit. Understanding the potential timeline when specific diseases may show up in fields can help target scouting and management strategies. The following calendar can be used as a guideline for scouting corn diseases. The specific time for scouting can be affected by planting date and growing degree day accumulation (Table1).

Table 1. Corn Diseases Calendar.

Stage I Emergence to Knee-high	Stage II Knee-high to tasseling	Stage III Tasseling to maturity
Seedling Blights		
Anthracnose Leaf Blight, Bacterial Wilt and Bacterial Leaf Blight (Stewart's Wilt, Stewart's Disease), Goss's Wilt, Physoderma Brown Spot, Common Smut, High Plains Virus		
	Northern Leaf Blight, Southern Leaf Blight, Common Rust, Southern Rust, Crazy Top, Sorghum Downy Mildew, Anthracnose Top Dieback & Stalk Rot, Bacterial Stalk Rot, Pythium Stalk Rot, Maize Chlorotic Dwarf Virus, Maize Dwarf Mosaic Virus, Corn Lethal Necrosis, Tar Spot	
		All Ear & Kernel Rots
		Gray Leaf Spot, Head Smut, Charcoal Rot, Diplodia Stalk Rot, Fusarium Stalk Rot, Gibberella Stalk Rot, Red Root Rot

Corn Product Selection

The first line of defense against corn diseases is tolerant corn products, especially in corn-on-corn rotations. Products are evaluated for tolerance to diseases that are common in each geography. Corn products are rated for resistance relative to known susceptible and resistant products using a 1 (best) to 9 (worst) rating system (Figures 1 and 2). Your seed representative can help with selecting a product with appropriate levels of resistance or tolerance to specific diseases.

In corn-on-corn rotations, opt for products with high yield potential, good resistance to leaf and stalk diseases, as well as good insect protection, and good emergence and seedling vigor traits. Diseases such as seedling blights, gray leaf spot (GLS), northern corn leaf blight (NCLB), many common stalk and ear rots, and in some areas Goss's Wilt are all potentially more severe in corn-on-corn production situations.

Managing Corn Diseases

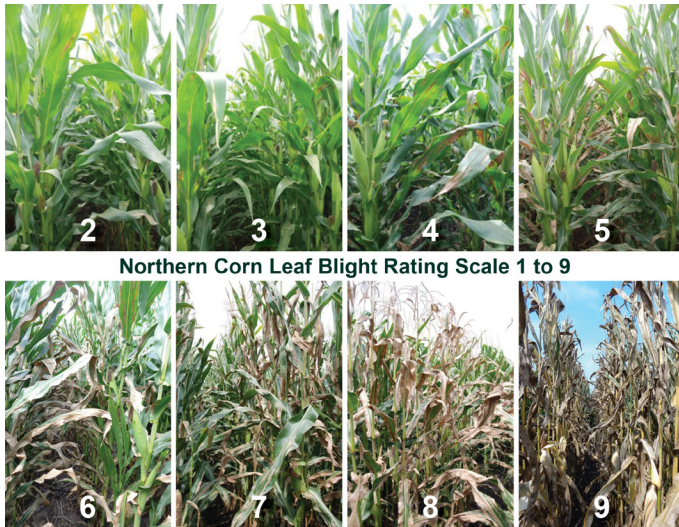


Figure 1. Example of foliar disease rating scale showing severity of northern corn leaf blight with 1 denoting few lesions on lower leaves; 3 light infection with lesions on lower leaves; 5 moderate infection lesions on lower and middle leaves; 7 lesions on lower leaves extending to upper leaves; and 9 very heavy infection lesions on all leaves and plant may be prematurely killed.

Crop Rotation and Residue Management

Many common corn diseases survive on infected corn residue. Crop rotation, tillage and residue management help to naturally reduce the level of many pathogens from crop residue and the soil by decreases inoculum levels which helps reduce the risk of some disease development. Surface residues also impact the soil environment (cooler soil temperatures, higher soil moisture), which can foster disease development. While crop rotation and residue management can help reduce the potential for some corn diseases, corn diseases such as Goss's Wilt, NCLB, tar spot and southern rust can be blown into corn fields from adjacent fields or even from long distances, depending on the disease.



Figure 2. Corn infected with northern corn leaf blight at a disease severity rating of 5.

Seed Treatment Fungicides

Seed treatment fungicides are a critical component of an integrated disease management strategy in corn. When corn is between germination and seedling establishment, protection against fungi that cause seed decay, seedling blight, and damping-off may be needed. Seed treatment fungicides help provide protection from these issues, particularly in high residue, cold, wet and/or compacted soils, or that are excessively dry. These environmental conditions can slow germination and emergence, leaving seeds and seedlings more susceptible to attack. The fungicides available in Acceleron® BASIC Seed Applied Solutions protect against the top three seedling diseases including *Fusarium*, *Pythium*, and *Rhizoctonia solani*. Acceleron® ELITE Seed Applied Solutions also protects against these soil-borne diseases and also helps to reduce the infections caused by *Colletotrichum graminicola*. Acceleron® Seed Applied Solutions products also contain insecticides that protect against early season insect damage. These may contribute to seedling disease management by protecting against root feeding insects, which can create wounds for fungal infection.

Managing Corn Diseases

Considerations for Foliar Fungicide Applications

Foliar fungicides are an important management option for fungal diseases. Plant health aspects such as photosynthetic capability, stress tolerance, standability, and grain quality can all be impacted when fungal diseases become established. A properly timed foliar fungicide application may greatly improve overall plant health and help protect yield potential.

Disease development in corn around the tasseling stage of growth (VT) can result in yield loss, particularly if favorable weather conditions support continued infection of leaves around and above the ear.

Foliar diseases of corn are a concern when they develop early and progress up the plant before grain fill is complete. Some diseases to watch for include northern corn leaf blight (NCLB), gray leaf spot (GLS), Southern Rust, eyespot, tar spot, and Anthracnose leaf blight. There are several Bayer fungicides labeled for use in corn that can help manage several of the foliar fungal diseases (Figure 3). Fungicides are not effective on bacterial diseases such as Goss's wilt.

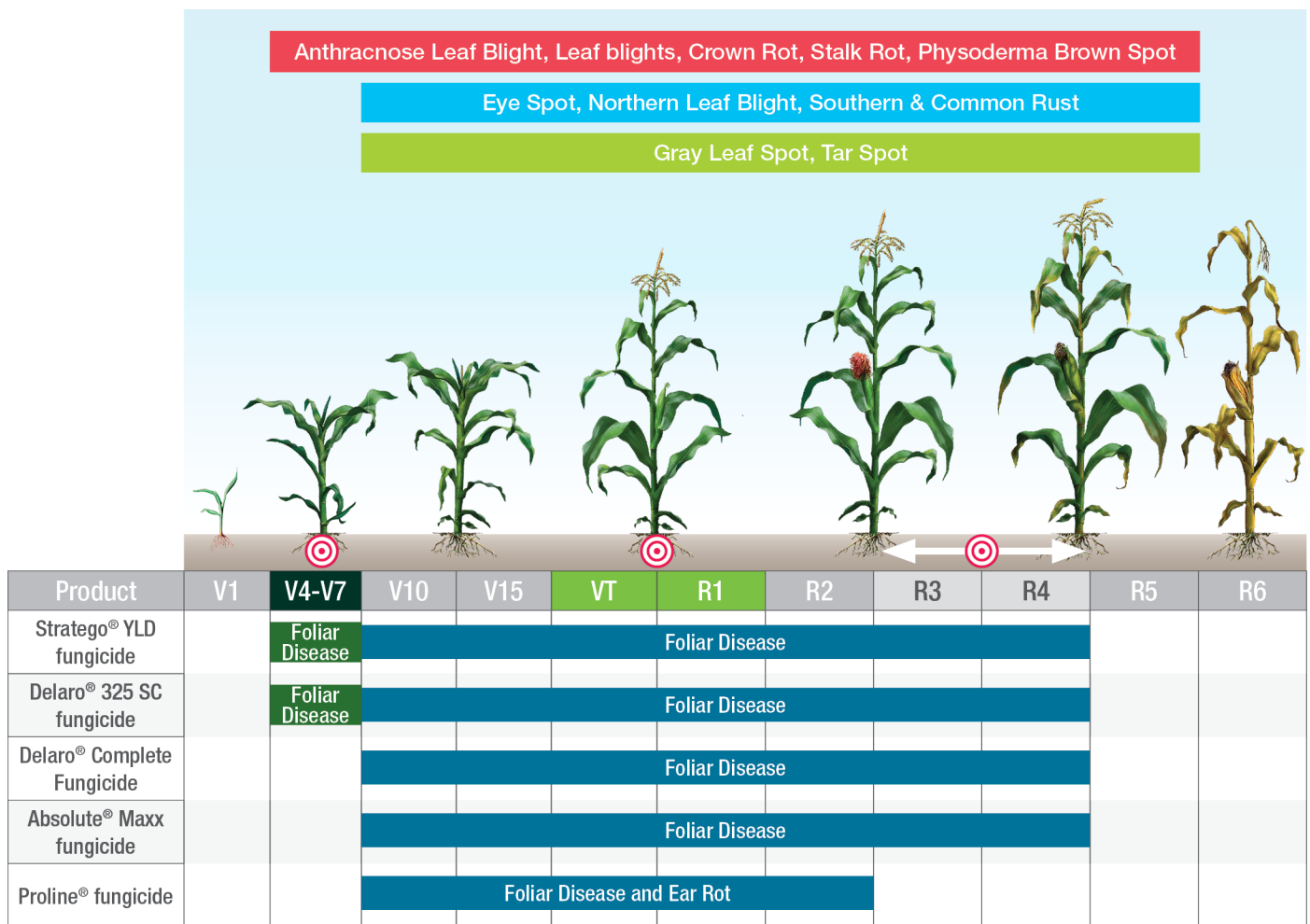


Figure 3. Bayer fungicide application timing.

Managing Corn Diseases

Fungicides typically work better at preventing rather than curing disease. Specifically, GLS lesions may take up to two weeks to become visible after infection. For that reason, scouting when weather conditions favor disease development is important. Begin scouting fields for foliar disease symptoms just before tasseling and continue through the grain filling stages of growth.

Rapid grain filling occurs from R2 (blister) to late R5 (full dent). It is especially important to protect the ear leaf, and those leaves above, as corn plants enter reproductive stages of growth. Examine the ear leaf and leaves above and below the ear at several locations throughout a field. If disease is present on a majority of the leaves, a fungicide application may be necessary (Figure 4).

Harvest restrictions vary by fungicide that is being considered for use. Depending on the product applied, fungicide harvest restrictions for field corn harvested for grain vary from 7 to 45 days or the R3 (milk) growth stage. Restrictions may also vary for other types of corn (sweet, seed or popcorn, etc.), and corn for other uses such as forage or fodder.² Always read and follow the product label instructions.



Figure 4. Aerial Application of fungicide-corn

Sources:

¹ Management of Corn Diseases in New York. Cornell College of Agriculture and Life Sciences (CALS). Corn disease management.

<https://cals.cornell.edu/field-crops/corn/diseases-corn/management#:~:text=Integrated%20corn%20disease%20management%20involves,when%20warranted%20by%20disease%20risk.>

² Telenko, D. 2021. Diseases of Corn: Fungicide Efficacy for Control of Corn Diseases. Purdue University Extension. Botany and Plant Pathology. PB-150-W. <https://mdc.itap.purdue.edu/item.asp?itemID=22746>.

Legal Statements

ALWAYS READ AND FOLLOW PESTICIDE LABEL DIRECTIONS. FOR CORN, EACH ACCELERON® SEED APPLIED SOLUTIONS OFFERING is a combination of separate individually registered products containing the active ingredients: **BASIC** plus Poncho®/VOTIVO® Offering for corn: metalaxyl, ethaboxam, prothioconazole, fluoxastrobin, clothianidin, Bacillus firmus I-1582. **ELITE** plus Poncho®/VOTIVO® Offering for corn: metalaxyl, ethaboxam, clothianidin, and Bacillus firmus I-1582; prothioconazole and fluoxastrobin at rates that suppress additional diseases. **BASIC** Offering for corn: metalaxyl, prothioconazole, fluoxastrobin, ethaboxam, and clothianidin. **ELITE** Offering for corn: metalaxyl, ethaboxam, and clothianidin; and prothioconazole and fluoxastrobin at rates that suppress additional diseases. **BioRise® Corn Offering** is the on-seed application of BioRise® 360 ST. BioRise® Corn Offering is included seamlessly across offerings on all class of 2017 and newer products.

The distribution, sale, or use of an unregistered pesticide is a violation of federal and/or state law and is strictly prohibited. Not all products are approved in all states.

Performance may vary, from location to location and from year to year, as local growing, soil and weather conditions may vary. Growers should evaluate data from multiple locations and years whenever possible and should consider the impacts of these conditions on the grower's fields.

Not all products are registered for use in all states and may be subject to use restrictions. The distribution, sale, or use of an unregistered pesticide is a violation of federal and/or state law and is strictly prohibited. Check with your local dealer or representative for the product registration status in your state. Poncho® and Votivo® are trademarks of BASF Corporation. Absolute®, Acceleron®, Bayer, Bayer Cross, BioRise®, Delaro®, Proline® and Stratego® are trademarks of Bayer Group. All other trademarks are the property of their respective owners. For additional product information call toll-free 1-866-99-BAYER (1-866-992-2937) or visit our website at www.BayerCropScience.us. Bayer CropScience LP, 800 North Lindbergh Boulevard, St. Louis, MO 63167. ©2023 Bayer Group. All rights reserved. 1211_70259