

## Commercial Crop Production Field Crops – Corn

<b>Table 1. Symptoms, source of inoculum and management of corn diseases.</b>	
<b>Disease</b>	
<p><b>Charcoal Rot</b> (<i>Macrophomina phaseolina</i>)</p>	<p><b>Symptoms:</b> Injury from this disease usually does not become evident until plants approach maturity. Diseased plants exhibit poorly developed ears, premature ripening, lodging and drying of the stalk. Stalks are soft and discolored at the base, and the pith becomes shredded.</p> <p><b>Source of Inoculum:</b> This fungus survives in old plant debris or in the soil.</p> <p><b>Management:</b> Rotate crops. Bury stubble. Maintain balanced potassium/nitrogen rates.</p>
<p><b>Common Rust</b> (<i>Puccinia sorghi</i>)</p>	<p><b>Symptoms:</b> Common rust can be recognized by small oval- to elongated-pustules, which are at first cinnamon-brown and then become brownish-black as the corn matures. The pustules may appear on any aboveground part of the plant but are most abundant on the leaves – scattered over both surfaces.</p> <p><b>Source of Inoculum:</b> Spores usually are windblown from the south. An alternate host is the wood sorrel (<i>Oxalis</i> sp.).</p> <p><b>Management:</b> Most hybrids are tolerant to this disease. Always use the recommended hybrids for your area.</p>
<p><b>Fusarium Stalk Rot</b> (<i>Fusarium</i> spp.)</p>	<p><b>Symptoms:</b> Leaves of infected plants become grayish-green as plants approach maturity. Softening and discoloration of the exterior of lower internodes occur. When stalks are affected with stalk rot, they split and generally will show a reddish discoloration of the diseased area.</p> <p><b>Source of Inoculum:</b> This fungus lives in old stubble or in the soil.</p> <p><b>Control:</b> Practice crop rotation. Plow crop residue under. Make sure adequate potassium is applied with high nitrogen rates.</p>
<p><b>Gray Leaf Spot</b> (<i>Cercospora zeaemaydis</i>)</p>	<p><b>Symptoms:</b> The early lesions produced on the corn leaves by <i>Cercospora zeaemaydis</i> are yellow to tan and look similar to those produced by other diseases, except they have a faint watery halo that can be seen when held up to the light. After about two weeks, the lesions appear tan to brown and rectangular shaped, bordered by the veins of the leaf. When fully expanded, individual lesions may be 3 to 4 inches long and 1/16- to 1/8-inch-wide, depending on the distance between veins. If several infections occur near each other on the same leaf, however, a broader lesion will result.</p> <p><b>Source of Inoculum:</b> The fungus causing gray leaf spot overwinters in and on corn debris left above and on the soil surface.</p> <p><b>Management:</b> Hybrids are available with moderate resistance. Crop rotation and clean plowing are effective in reducing the level of surviving fungus in fields.</p>
<p><b>Northern Corn Leaf Blight</b> (<i>Exserohilum tursicum</i>)</p>	<p><b>Symptoms:</b> Leaves of infected plants have a few to numerous elongated (up to 1 inch by 6 inches) leaf spots that are tan but reveal black spore growth at maturity.</p> <p><b>Source of Inoculum:</b> Carried on the seed and in old plant refuse, spores also are readily windborne.</p>

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<b>Disease</b>	
	<p><b>Management:</b> Disease resistance is available. The hybrids should also be ones recommended for your area.</p>
<p><b>Smut</b> (<i>Ustilago maydis</i>)</p>	<p><b>Symptoms:</b> All aboveground parts of the plant are susceptible, particularly the young, actively growing embryonic corn tissue. Symptoms are easily recognized. Galls are first covered with a glistening greenish-white to silvery-white membrane. Except for galls on leaves, the interiors of the galls soon darken, with the membrane rupturing to expose millions of greasy to powdery, sooty spores known as chlamydospores or teliospores. Galls on leaves seldom develop beyond pea-size, becoming hard and dry without rupturing. Early infection may kill young plants, but not often.</p> <p><b>Source of Inoculum:</b> The teliospores of this fungus overwinter on the soil surface.</p> <p><b>Control:</b> Use hybrids recommended for your area. Most have adequate resistance.</p>
<p><b>Southern Leaf Blight</b> (<i>Bipolaris maydis</i> = <i>Helminthosporium maydis</i>)</p>	<p><b>Symptoms:</b> Leaves of infected plants have numerous elongated spots between the veins. The spots are buff to reddish-brown.</p> <p><b>Source of Inoculum:</b> Carried on the seed and in old plant refuse, spores also are readily windborne.</p> <p><b>Management:</b> Use only seed produced by normal tasseling (N). The hybrids also should be ones recommended for your area.</p>
<p><b>Southern Rust</b> (<i>Puccinia polysora</i>)</p>	<p><b>Symptoms:</b> Southern rust is recognized by small circular to oval pustules, which are light cinnamon-brown. The pustules may appear on leaves and sheaths but are most abundant on the leaves.</p> <p><b>Source of Inoculum:</b> Spores are windblown from the south. No alternate host is known.</p> <p><b>Management:</b> Use hybrids tolerant to this disease. Fungicides might be necessary if southern rust symptoms are expressed prior to soft dough growth stage.</p>

### Management of Corn Diseases Using Fungicides

Based on fungicide experimentation over the past five years, it has been determined that fungicides should only be used if corn foliar diseases are present and threaten the ear leaf with diseased areas covering 5% or more.

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### Fungicide Efficacy for Management of Corn Diseases—January 2018

The Corn Disease Working Group (CDWG), which includes LSU AgCenter pathologists, develops ratings for how well fungicides control major corn diseases in the United States. The ratings are determined by field testing the materials over multiple years and locations. Ratings are based on the product's level of disease control and does not necessarily reflect yield increases obtained from product application. A product's efficacy depends upon proper application timing, rate, and application method as determined by the product label and overall disease level in the field at the time of application. Differences in efficacy among each fungicide product were determined by directly comparing products in field tests using a *single application* of the labeled rate. **The table includes marketed products available that have been tested over multiple years and locations and is not intended to be a list of all labeled products.**

Efficacy categories: NR=Not Recommended; P=Poor; F=Fair; G=Good; VG=Very Good; E=Excellent; NL = Not Labeled for use against this disease; U = Unknown efficacy or insufficient data to rank product

Fungicide Class	Active ingredient (%)	Product/trade name	Rate/A (fl oz)	Gray leaf spot	Northern leaf blight	Southern rust	Harvest restriction <sup>1</sup>
QoI Strobilurins Group 11	azoxystrobin 22.9%	Quadris 2.08 SC multiple generics	6.0 - 15.5	E	G	G	7 days
	pyraclostrobin 23.6%	Headline 2.09 EC/SC	6.0 - 12.0	E	VG	VG	7 days
	picoxystrobin 22.5%	Aproach 2.08 SC	3.0 - 12.0	F-VG	VG	G	7 days
DMI Triazoles Group 3  Mixed modes of action	propiconazole 41.8%	Tilt 3.6 EC multiple generics	2.0 - 4.0	G	F-G	F-G	30 days
	prothioconazole 41.0%	Proline 480 SC	5.7	U	VG	G	14 days
	tebuconazole 38.7%	Folicur 3.6 F multiple generics	4.0 - 6.0	U	VG	F-G	36 days
	tetraconazole 20.5%	Domark 230 ME	4.0 - 6.0	E	VG	VG	R3 (milk)
	azoxystrobin 13.5% propiconazole 11.7%	Quilt Xcel 2.2 SE multiple generics	10.5 - 14.0	E	VG	VG	30 days
	benzovindiflupyr 2.9% azoxystrobin 10.5% propiconazole 11.9%	Trivapro	13.7	E	VG	E	30 days
	cyproconazole 7.17% picoxystrobin 17.94%	Aproach Prima 2.34 SC	3.4 - 6.8	E	VG	G-VG	30 days
	flutriafol 19.3% fluoxastrobin 14.84%	Fortix 3.22 SC Preemptor 3.22 SC	4.0 - 6.0	E	VG-E	VG	R4 (dough)
	pyraclostrobin 28.58% fluxapyroxad 14.33%	Priaxor 4.17 SC	4.0 - 8.0	VG	U	G	21 days
	pyraclostrobin 13.6% metconazole 5.1%	Headline AMP 1.68 SC	10.0 - 14.4	E	VG	G-VG	20 days
	trifloxystrobin 32.3% prothioconazole 10.8%	Stratego YLD 4.18 SC	4.0 - 5.0	E	VG	G-VG	14 days
	tetraconazole 7.48% azoxystrobin 9.35%	Affiance 1.5 SC	10.0 - 14.0	U	VG	VG	7 days

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<sup>1</sup>Harvest restrictions are listed for field corn harvested for grain. Restrictions may vary for other types of corn (sweet, seed or popcorn, etc.), and corn for other uses such as forage or fodder.

\*This information is provided only as a guide. It is the applicator's legal responsibility to read and follow all current label directions. Reference in this publication to any specific commercial product is for general information only and does not constitute an endorsement or recommendation by the CDWG. Individuals using such products assume responsibility for their use in accordance with current directions of the manufacturer. Members or participants in the CDWG assume no liability resulting from the use of these products.

<b>Table 3. Recommended fungicides, rates and application timing for corn diseases.</b>					
<b>Target</b>	<b>Product Choices<sup>1</sup> and Product Mode of Action Group<sup>2</sup></b>	<b>Rate<sup>3</sup></b>	<b>Time of Application</b>	<b>PHI<sup>4</sup></b>	
Leaf Blights (primarily Helminthosporium and Excerohilum spp.)	AmTide Propiconazole 41.8% EC	3	2-4 oz	At first appearance	30
	Avaris	11	7-14 oz	At first appearance	30
	Bumper	3	2-4 fl oz	At first appearance	30
	Delaro	3,11	8-12 fl oz	At first appearance	14
	Fitness	3	2-4 oz	At first appearance	30
	Headline AMP	11	10-14.4 oz	Prior to disease development	20
	Headline SC	11	6-12 oz	Prior to disease development	7
	Manzate Flowable	M	1.2 quarts	At first appearance	7
	Orius 3.6F	3	4-6 fl oz	Prior to disease development	36
	Penncozeb 75DF	M	1-1.5 lb	Onset of disease	40
	Penncozeb 80WP	7	1-1.5 lb	Onset of disease	40
	PropiMax	3	2-4 fl oz	At first appearance	30
	Quadris	11	6.2-9 fl oz	Prior to disease development	7
	Quadris S	11	9.2-15.4 fl oz	Prior to disease development	7
	Quilt	11,3	7-14 oz	At first appearance	30
	Quilt Xcel	11,3	7-14 oz	At first appearance	30
	Stratego	11,3	10-12 oz	At first appearance	30
Stratego YLD	11,3	4-5 oz	At first appearance	14	
Tebuzol 3.6F	3	4-6 fl oz	Prior to disease development	36	
Tilt	3	2-4 oz	At first appearance	30	
Rust (Common only)	Quadris	11	6.2-9 fl oz	Prior to disease development	7
	Quadris S	11	6.2-9 fl oz	Prior to disease development	7
Rusts (Common and southern)	AmTide Propiconazole 41.8% EC	3	2-4 oz	At first appearance	30
	Bumper	3	4 fl oz	At first appearance	30
	Delaro	3,11	8-12 fl oz	At first appearance	14
	Fitness	3	4 fl oz	At first appearance	30
	Headline AMP	11	10-14.4 oz	Prior to disease development	20
	Headline SC	11	6-12 oz	Prior to disease development	7
	Orius 3.6F	3	4-6 fl oz	Prior to disease development	36
	PropiMax	3	2-4 fl oz	At first appearance	30
	Quilt	11,3	10.5-14 oz	At first appearance	30
	Quilt Xcel	11,3	10.5-14 oz	At first appearance	30
	Stratego	11,3	10-12 oz	At first appearance	30
	Stratego YLD	11,3	4-5 oz	At first appearance	14

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<b>Target</b>	<b>Product Choices<sup>1</sup> and Product Mode of Action Group<sup>2</sup></b>		<b>Rate<sup>3</sup></b>	<b>Time of Application</b>	<b>PHI<sup>4</sup></b>
	Tebuzol 3.6F	3	4-6 fl oz	Prior to disease development	36
	Tilt	3	4 oz	At first appearance	30
<sup>1</sup> Reference to commercial or trade names is made with the understanding that no discrimination is intended nor endorsement of a particular product by LSU or the LSU AgCenter is implied. <sup>2</sup> Mode of action groups are determined by the Fungicide Resistance Action Committee (FRAC). <sup>3</sup> Rates are the amount of formulation (product) per acre unless otherwise indicated. <sup>4</sup> Preharvest interval (PHI) is the minimum number of days allowed between the last application and harvest.					

The corn section was revised September 2018 by Boyd Padgett.