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Table 1. Symptoms, source of inoculum and management of corn diseases.	
Disease	
Charcoal Rot (*Macrophomina phaseolina*)	**Symptoms:** 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. **Source of Inoculum:** This fungus survives in old plant debris or in the soil. **Management:** Rotate crops. Bury stubble. Maintain balanced potassium/nitrogen rates.
Common Rust (*Puccinia sorghi*)	**Symptoms:** 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. **Source of Inoculum:** Spores usually are windblown from the south. An alternate host is the wood sorrel (*Oxalis* sp.). **Management:** Most hybrids are tolerant to this disease. Always use the recommended hybrids for your area.
Fusarium Stalk Rot (*Fusarium* spp.)	**Symptoms:** 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. **Source of Inoculum:** This fungus lives in old stubble or in the soil. **Control:** Practice crop rotation. Plow crop residue under. Make sure adequate potassium is applied with high nitrogen rates.
Gray Leaf Spot (*Cercospora zeae-maydis*)	**Symptoms:** The early lesions produced on the corn leaves by *Cercospora zeae-maydis* 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 of an 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. **Source of Inoculum:** The fungus causing gray leaf spot overwinters in and on corn debris left above and on the soil surface. **Management:** Hybrids are available with moderate resistance. Crop rotation and clean plowing are effective in reducing the level of surviving fungus in fields.
Northern Corn Leaf Blight (*Exserohilum tursicum*)	**Symptoms:** 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. **Source of Inoculum:** Carried on the seed and in old plant refuse, spores also are readily windborne. **Management:** Disease resistance is available. The hybrids should also be ones recommended for your area.

Table 1. Symptoms, source of inoculum and management of corn diseases.	
Disease	
Smut (*Ustilago maydis*)	**Symptoms:** 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. **Source of Inoculum:** The teliospores of this fungus overwinter on the soil surface. **Control:** Use hybrids recommended for your area. Most have adequate resistance.
Southern Leaf Blight (*Bipolaris maydis* = *Helminthosporium maydis*)	**Symptoms:** Leaves of infected plants have numerous elongated spots between the veins. The spots are buff to reddish-brown. **Source of Inoculum:** Carried on the seed and in old plant refuse, spores also are readily windborne. **Management:** Use only seed produced by normal tasseling (N). The hybrids also should be ones recommended for your area.
Southern Rust (*Puccinia polysora*)	**Symptoms:** 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. **Source of Inoculum:** Spores are windblown from the south. No alternate host is known. **Management:** Use hybrids tolerant to this disease. Fungicides might be necessary if southern rust symptoms are expressed prior to soft dough growth stage.

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 percent or more.

The Corn Disease Working Group (CDWG) has developed the following information on fungicide efficacy for control of major corn diseases in the United States. Efficacy ratings for each fungicide listed in the table were determined by field testing the materials over multiple years and locations by the members of the committee. Efficacy ratings are based upon level of disease control achieved by product and do not necessarily reflect yield increases obtained from product application. Efficacy depends upon proper application timing, rate and application method to achieve optimum effectiveness of the fungicide as determined by labeled instructions and overall level of disease in the field at the time of application. Differences in efficacy among fungicide products were determined by direct comparisons among products in field tests and are based on a single application of the labeled rate as listed in Table 2. Available systemic fungicides that have been tested over multiple years and locations are provided in Table 2. The information in Table 2 is not intended to be a list of all labeled products.

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Table 2. Efficacy of systemic fungicides in managing corn diseases.
Efficacy categories are as follows: NR = Not Recommended; P=Poor; F=Fair; G=Good; VG=Very Good; E=Excellent; NL = Not Labeled for use against this disease; -- indicates insufficient data to state the efficacy of this product for this disease.

Fungicide[1] Information				Disease				
Class and Mode of Action Group[2]	**Active Ingredient**	**Product[3]**	**Rate[4] (fl oz)**	**Common Rust**	**Gray Leaf Spot**	**Northern Leaf Blight**	**Southern Rust**	**Harvest Restrictions[5]**
QoI Strobilurins Group 11	Azoxystrobin, 22.9%	Quadris 2.08 SC	6-15.5	E	E	G	G	7 days
	Fluoxastrobin, 40.3%	Evito 480 SC	2-5.7	--	--	--	--	R4, dough
	Pyraclostrobin, 23.6%	Headline 2.09 EC/SC	6-12	E	E	VG	E	7 days
	Picoxystrobin	Aproach 2.08 SC	3-12	--	--	--	--	7 days
DMI Triazoles Group 3	Propiconazole, 41.8%	Tilt 3.6 EC, MG7	2-4	VG	G	G	G	30 days
	Prothioconazole, 41.0%	Proline 480 SC	5.7	--	--	VG	G	14 days
	Tebuconazole, 38.7%	Folicur 3.6F, MG7	4-6	--	--	VG	--	36 days
	Tetraconazole, 20.5%	Domark 230 ME	4-6	--	--	--	G	R3, milk

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Table 2. Efficacy of systemic fungicides in managing corn diseases.
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Fungicide[1] Information				Disease				
Class and Mode of Action Group[2]	**Active Ingredient**	**Product[3]**	**Rate[4] (fl oz)**	**Common Rust**	**Gray Leaf Spot**	**Northern Leaf Blight**	**Southern Rust**	**Harvest Restrictions[5]**
Mixed[6]	Azoxystrobin, 7.0% Propiconazole, 1.7%	Quilt 200 SC	7-14	VG-E	E	VG	VG	30 days
	Azoxystrobin 13.5% Propiconazole 11.7%	Quilt Xcel 2.2 SE	10.5-14	VG-E	E	VG	VG	30 days
	Pyraclostrobin 13.6% Metconazole 5.1%	Headline AMP 1.68 SC	10-14.4	E	E	VG	VG	20 days
	Pyraclostrobin 8.58% Fluxapyroxad 14.33%	Priaxor 4.17 SC	4-8	--	--	--	G	21 days
	Trifloxystrobin 11.4% Propiconazole 11.4%	Stratego 250 EC	10-12	VG	VG	G	G	14 days

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Table 2. Efficacy of systemic fungicides in managing corn diseases.
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Fungicide[1] Information				Disease				
Class and Mode of Action Group[2]	**Active Ingredient**	**Product[3]**	**Rate[4] (fl oz)**	**Common Rust**	**Gray Leaf Spot**	**Northern Leaf Blight**	**Southern Rust**	**Harvest Restrictions[5]**
	Trifloxystrobin 32.3% Prothioconazole 10.8%	Stratego YLD 4.18 SC	4-5	E	E	VG	VG	30 days

[1]Additional fungicides are labeled for disease on corn, including contact fungicides such as chlorothalonil. Certain fungicides may be available for diseases not listed in the table, including Gibberella and Fusarium ear rot. Applications of Proline 480 SC for use on ear rots requires a FIFRA Section 2(ee) and is only approved for use in Illinois, Indiana, Iowa, Louisiana, Maryland, Michigan, Mississippi, North Dakota, Ohio, Pennsylvania and Virginia.
[2]Mode of action groups are determined by the Fungicide Resistance Action Committee (FRAC).
[3]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. Many products have specific use restrictions about the amount of active ingredient that can be applied within a period of time or the amount of sequential applications that can occur. Please read and follow all specific-use restrictions prior to fungicide use. This information is provided only as a guide. It is the responsibility of the pesticide applicator by law to read and follow all current label directions. Members or participants in the CDWG assume no liability resulting from the use of these products.
[4]Rates are the amount of formulation (product) per acre unless otherwise indicated.
[5]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.
[6]Refer to product label for the fungicide class and mode of action group.
[7]Multiple generic fungicides available.

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The Corn Disease Working Group (CDWG) has developed the following information on fungicide efficacy for control of major corn diseases in the United States. Efficacy ratings for each fungicide listed in the table were determined by field testing the materials over multiple years and locations by the members of the committee. Efficacy ratings are based upon level of disease control achieved by product and are not necessarily reflective of yield increases obtained from product application. Efficacy depends upon proper application timing, rate and application method to achieve optimum effectiveness of the fungicide as determined by labeled instructions and overall level of disease in the field at the time of application. Differences in efficacy among fungicide products were determined by direct comparisons among products in field tests and are based on a *single application* of the labeled rate as listed in the table. **Table includes systemic fungicides available that have been tested over multiple years and locations. The table is not intended to be a list of all labeled products[1]**. 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(s) Class	Active ingredient (%)	Product/Trade name	Rate/A (fl oz)	Common rust	Gray leaf spot	Northern leaf blight	Southern rust	Harvest Restriction[2]
QoI Strobilurins Group 11	**Azoxystrobin 22.9%**	**Quadris 2.08 SC Multiple Generics**	**6.0 - 15.5**	E	E	G	G	7 days
	Pyraclostrobin 23.6%	**Headline 2.09 EC/SC**	**6.0 - 12.0**	E	E	VG	VG	7 days
	Picoxystrobin	**Aproach 2.08 SC**	**3.0 – 12.0**	VG-E	F-VG	VG	G	7 days
DMI Triazoles Group 3	**Propiconazole 41.8%**	**Tilt 3.6 EC Multiple Generics**	**2.0 - 4.0**	VG	G	G	F-G	30 days
	Prothioconazole 41.0%	**Proline 480 SC**	**5.7**	VG	U	VG	G	14 days
	Tebuconazole 38.7%	**Folicur 3.6 F Multiple Generics**	**4.0 - 6.0**	U	U	VG	F-G	36 days
	Tetraconazole 20.5%	**Domark 230 ME**	**4.0 – 6.0**	U	E	U	G	R3 (milk)
Mixed modes of action	**Azoxystrobin 13.5% Propiconazole 11.7%**	**Quilt Xcel 2.2 SE**	**10.5 - 14.0**	VG-E	E	VG	VG	30 days
	Benzovindiflupyr 10.27% Azoxystrobin 13.5% Propiconazole 11.7%	**Trivapro A 0.83 + Trivapro B 2.2 SE**	**A = 4.0 B = 10.5**	U	E	VG	E	7 days (A) 30 days (B)

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Cyproconazole 7.17% Picoxystrobin 17.94%	**Aproach Prima 2.34 SC**	**3.4 – 6.8**	U	E	VG	G-VG	30 days
Flutriafol 19.3% Fluoxastrobin 14.84%	**Fortix 3.22 SC Preemptor 3.22 SC**	**4.0 - 6.0**	U	E	VG-E	VG	R4 (dough)
Pyraclostrobin 28.58% Fluxapyroxad 14.33%	**Priaxor 4.17 SC**	**4.0 – 8.0**	VG	VG	U	G	21 days
Pyraclostrobin 13.6% Metconazole 5.1%	**Headline AMP 1.68 SC**	**10.0 - 14.4**	E	E	VG	G-VG	20 days
Trifloxystrobin 32.3% Prothioconazole 10.8%	**Stratego YLD 4.18 SC**	**4.0 - 5.0**	E	E	VG	G-VG	14 days
Tetraconazole 7.48% Azoxystrobin 9.35%	**Affiance 1.5 SC**	**10.0- 14.0**	U	U	U	G	7 days

[1]Additional fungicides are labeled for disease on corn, including contact fungicides such as chlorothalonil. Certain fungicides may be available for diseases not listed in the table, including Gibberella and Fusarium ear rot. Applications of Proline 480 SC for use on ear rots requires a FIFRA Section 2(ee) and is only approved for use in Illinois, Indiana, Iowa, Louisiana, Maryland, Michigan, Mississippi, North Dakota, Ohio, Pennsylvania and Virginia.
[2]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.

Many products have specific use restrictions about the amount of active ingredient that can be applied within a period of time or the amount of sequential applications that can occur. Please read and follow all specific use restrictions prior to fungicide use. This information is provided only as a guide. It is the responsibility of the pesticide applicator by law to read and follow all current label directions. Reference to products in this publication is not intended to be an endorsement to the exclusion of others that may be similar. Persons 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.

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Table 3. Recommended fungicides, rates and application timing for corn diseases.					
Target	**Product Choices[1] and Product Mode of Action Group[2]**		**Rate[3]**	**Time of Application**	**PHI[4]**
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
	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
	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

Table 3. Recommended fungicides, rates and application timing for corn diseases.

Target	Product Choices[1] and Product Mode of Action Group[2]		Rate[3]	Time of Application	PHI[4]
	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	4 oz	At first appearance	30

[1]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.
[2]Mode of action groups are determined by the Fungicide Resistance Action Committee (FRAC).
[3]Rates are the amount of formulation (product) per acre unless otherwise indicated.
[4]Preharvest interval (PHI) is the minimum number of days allowed between the last application and harvest.

The corn section was revised October 2017 by Dr. C. Hollier.