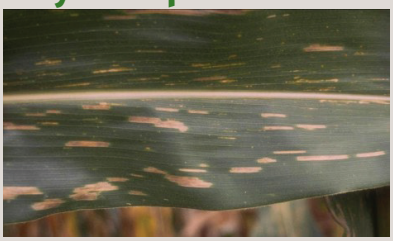
Foliar Fungicide Considerations for Corn

Southern Indiana

Gray Leaf Spot



Extended periods of leaf wetness (13 hours) allow infection of leaves. Typical lesions are rectangular with straight edges. The lesions can grow together and kill entire leaves. High relative humidity (>90 percent) can lead to increased disease.

Northern Leaf Blight

Infection occurs when there is free water on the leaf surface for 6-18 hours and temperatures are 65-80° F. Lesions are 1 to 6 inches long and cigar shaped. Yield losses are most severe when the disease infects plants early and progresses to the upper plant leaves by pollination or early ear fill.

Scout for foliar diseases in corn just before tassel emergence and answer the following questions when considering an application of foliar fungicide:

What was the previous crop? Many foliar pathogens survive in corn residue, so the risk of foliar diseases (such as gray leaf spot and northern leaf blight) increases when corn is planted back into a field that was corn the previous year.

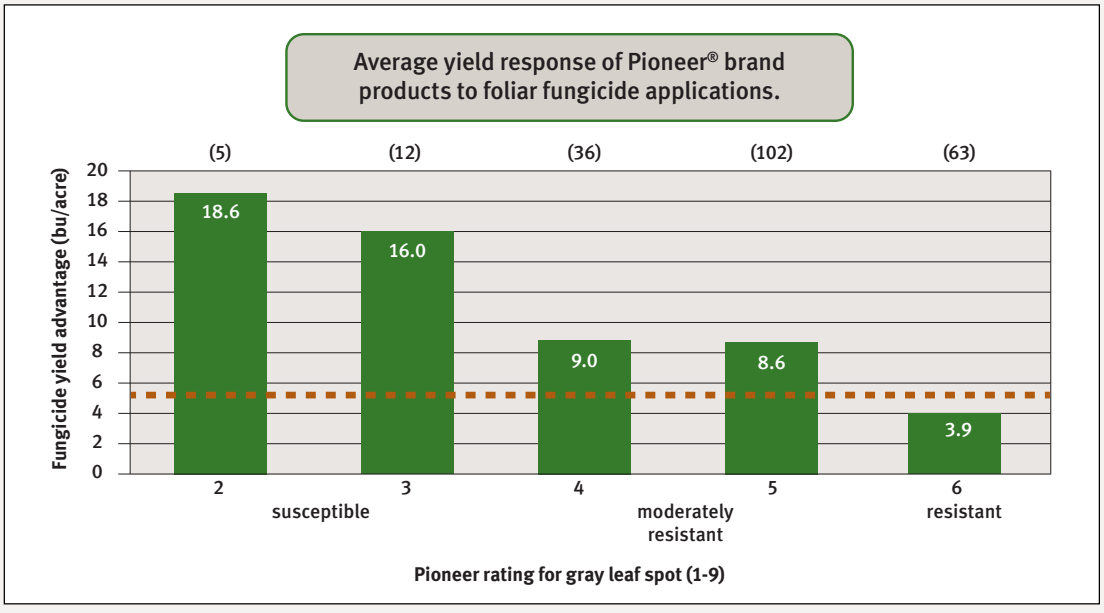
What has the weather been? Rainy and/or humid weather generally is most favorable to foliar diseases. In growing seasons when these conditions prevail, the risk for disease development increases.

Does the field have a history of disease? Some field locations may have a history of high foliar disease severity. Fields in river bottoms or low areas or surrounded by trees may be more prone to having foliar corn diseases.

What is the susceptibility level of the hybrid? If the disease resistance rating is a 6 or greater, a fungicide application may not provide a benefit. For hybrids with a rating less than 4, spray if disease symptoms are present on the third leaf below the ear or higher on 50 percent of the plants examined.

For hybrids with a rating of 5, spray:

- if disease symptoms are present on the third leaf below the ear or higher on 50 percent of the plants examined,
- if the field is in an area with a history of foliar disease problems,
- if the previous crop was corn,
- if there is 35 percent or more surface residue,
- if the weather is warm and humid.



Average yield response of Pioneer® brand hybrids to foliar fungicide application according to gray leaf spot disease rating (300 trials, 1999-2008).

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Platform	Hybrid/Brand***	End Use Segment	Technology Segment	CRM	Gray Leaf Spot	Foliar Fungicide Response-GLS	Northern Leaf Blight	Foliar Fungicide Response - NLB	Stalk Strength	Root Strength
P0216	P0216AM		AM,LL,RR2	102	4	HP	5	MP	6	6
P0496	P0496AMX		AMX,LL,RR2	104	4	HP	6	LP	6	7
P0589	P0589AMT		AMT,LL,RR2	105	5	MP	5	MP	5	8
35K01	35K08	WX		106	5	MP	4	HP	5	5
P0636	P0636AM		AM,LL,RR2	106	5	MP	4	HP	5	7
P0636	P0636E	WX		106	5	MP	4	HP	5	7
P0825	P0825AMXT		AMXT,LL,RR2	108	6	LP	6	LP	6	5
P0832	P0832E	WX		108	4	HP	5	MP	4	4
P0858	P0858AMX		AMX,LL,RR2	108	4	HP	4	HP	4	4
P0909	P0909AM		AM,LL,RR2	109	5	MP	5	MP	4	4
P0928	P0928			109	5	MP	6	LP	8	4
P0945	P0945AMX		AMX,LL,RR2	109	5	MP	5	MP	3	3
P0987	P0987AM		AM,LL,RR2	109	5	MP	4	HP	5	6
P0993	P0993			109	5	MP	4	HP	5	5
P0993	P0993HR		HX1,LL,RR2	109	5	MP	4	HP	5	5
P1018	P1018E	WX		110	6	LP	5	MP	6	4
P1023	P1023AM		AM,LL,RR2	110	5	MP	6	LP	6	8
P1023	P1023E	WX		110	5	MP	6	LP	6	8
P1105	P1105			111	6	LP	4	HP	4	6
P1105	P1105AM		AM,LL,RR2	111	6	LP	4	HP	4	6
P1105	P1105R		RR2	111	6	LP	4	HP	4	6
P1180	P1180XR	BMR	HXX,LL,RR2	111			5	MP		7
P1197	P1197AM		AM,LL,RR2	111	5	MP	6	LP	8	5
P1197	P1197AMXT		AMXT,LL,RR2	111	5	MP	6	LP	8	5
P1221	P1221AMXT		AMXT,LL,RR2	112	6	LP	6	LP	7	7
P1248	P1248AM		AM,LL,RR2	112	6	LP	5	MP	8	4
P1257	P1257AM		AM,LL,RR2	112	6	LP	5	MP	5	5
P1271	P1271AM		AM,LL,RR2	112	5	MP	5	MP	7	3
33T56	33T54	WX		113	5	MP	5	MP	7	4
33T56	33T55		RR2	113	5	MP	5	MP	7	4
33T56	33T56			113	5	MP	5	MP	7	4
P1306W	P1306W	WH		113	6	LP	6	LP	8	8
P1309W	P1309WYHR	WH	YHR,LL,RR2	113	5	MP	6	LP	8	8
P1311	P1311AMXT		AMXT,LL,RR2	113	5	MP			5	6
P1319	P1319			113	5	MP	5	MP	5	8
P1319	P1319HR		HX1,LL,RR2	113	5	MP	5	MP	5	8
P1339	P1339AM1		AM1,LL,RR2	113	6	LP	5	MP	5	6
P1352	P1352AMXT		AMXT,LL,RR2	113	4	HP	5	MP	5	5
P1360	P1360			113	6	LP	6	LP	6	6
P1360	P1360AM		AM,LL,RR2	113	6	LP	6	LP	6	6
P1360	P1360CHR		RW,HX1,LL,RR2	113	6	LP	6	LP	6	6
P1417	P1417AMX		AMX,LL,RR2	114	4	HP	6	LP	6	4
P1431W	P1431W	WH		114	6	LP	4	HP	7	6
P1431W	P1431WR	WH	RR2	114	6	LP	4	HP	7	6
P1449	P1449XR	BMR	HXX,LL,RR2	114	4	HP	5	MP		5
P1477W	P1477W	WH		114	6	LP	6	LP	8	7
P1477W	P1477WHR	WH	HX1,LL,RR2	114	6	LP	6	LP	8	7
P1479	P1479AM		AM,LL,RR2	114	5	MP	5	MP	8	4
P1498	P1498			114	6	LP	5	MP	6	5
P1498	P1498AM		AM,LL,RR2	114	6	LP	5	MP	6	5
P1498	P1498E	WX		114	6	LP	6	MP	6	5
P1498	P1498R		RR2	114	6	LP	5	MP	6	5
P1555	P1555CHR		RW,HX1,LL,RR2	115	6	LP	6	LP	8	5
P1602	P1602			116	5	MP	4	HP	4	8
P1602	P1602AM		AM,LL,RR2	116	5	MP	4	HP	4	8
P1646	P1646AM		AM,LL,RR2	116	5	MP	4	HP	7	8
P1659W	P1659W	WH		116	6	LP	6	LP	8	7
P1659W	P1659WHR	WH	HX1,LL,RR2	116	6	LP	6	LP	8	7
32B10	32B09	WH	RR2	117	5	MP	5	MP	7	4
32B10	32B10	WH		117	5	MP	5	MP	7	4
32B10	32B16	WH	HX1,LL,RR2	117	5	MP	5	MP	7	4
P2088	P2089AM		AM,LL,RR2	120	6	LP	5	MP	8	4

* NEW

** All Pioneer products are hybrids unless designated with AM1, AM, AMRW, AMX and AMXT, in which case they are brands.

IMPORTANT: Trait rating scores provide key information useful in selection and management of Pioneer® brand products in your area. Information and ratings are based on comparisons with other Pioneer brand products, not competitive products. Information and scores are assigned by DuPont Pioneer Research Managers. Scores are based on period-of-years testing through 2013 harvest and were the latest available at time of printing. Some scores may change after 2014 harvest. Scores represent an average of performance data across areas of adaptation, multiple growing conditions, and a wide range of both climate and soil types, and may not predict future results. All products within a hybrid family receive the same score unless observations indicate a significant difference. Individual product responses are variable and subject to a variety of environmental, disease and pest pressures. Please use this information as only one component of your product positioning decision. Refer to www.pioneer.com/products or contact a Pioneer sales professional for the latest and most complete listing of traits and scores for each Pioneer brand product and for product placement and management suggestions specific to your operation and local conditions.

RATINGS: 9 = Outstanding; **1** = Poor; PAA = Predicts Above Average; **PA** = Predicts Average; **PBA** = Predicts Below Average; **Blank** = Insufficient Data.

DISEASE & PEST RATINGS: 8-9 = Highly Resistant; **6-7** = Resistant; **4-5** = Moderately Resistant; **1-3** = Susceptible; **PAA** = Predicts Above Average; **PA** = Predicts Average; **PBA** = Predicts Below Average; Blank = Insufficient Data.

WHITE AND WAXY CORN RATINGS: Based on comparisons with other Pioneer brand products, not competitive products. Yield and other trait ratings for white and waxy products reflect comparison with non-modified yellow products of a similar maturity.

[1] **FAMILY:** Family identifies products that have the same base genetics. Manage products within the same family similarly.

[2] **GRAY LEAF SPOT PRECAUTION:** Avoid planting products with a lower gray leaf spot (GLS) rating in continuous corn fields that have a history of GLS infection, unless tillage operations that bury significant amounts of corn residue and inoculum are practiced.

[3] **NORTHERN LEAF BLIGHT CAUTION:** In conditions where northern leaf blight (NLB) risk is high, growers should consider planting only products with at least moderate NLB resistance ratings of 4 or higher.

[4] **CRM** (Comparative Relative Maturity)**:** There is not an industry standard for maturity ratings so comparing product maturity and harvest moisture ratings between companies is usually difficult. Use the CRM rating to compare Pioneer brand products with competitive products of a similar maturity and harvest moisture. CRM ratings, and harvest moistures, for products within a family may vary slightly, depending upon the level of insect (ECB and CRW) infestation. Conventional and straight products with the RR2 gene within a family will usually be 1-2 CRMs earlier than indicated, when insect infestations are moderate to heavy. One CRM difference is about ½ point of moisture difference at harvest.

[5] **MARKET SEGMENT:** Designations indicate product is also suitable for the following market: **HAE** – High Available Energy (Pork & Poultry Feed); **HTF** – High Total Fermentables (Dry-Grind Ethanol); **HES** – High Extractable Starch (Wet Milling); **WX** – Waxy; **WH** – White food corn; **YFC** – Yellow food corn; **AQ** – Optimum® AQUAmax® product; **BMR** – Brown MidRib Corn.

[6] **FOLIAR FUNGICIDE RESPONSE – GLS:** Probability of positive yield response to foliar fungicide applications when significant levels of Gray Leaf Spot (GLS) leaf disease is present. **HP** - High Probability; **MP** – Moderate Probability; **LP** – Low Probability. Probabilities based upon product disease scores. Because of the unlimited number of growing environments, cropping practices, and foliar fungicide active ingredients combinations possible, DuPont Pioneer makes no warranty regarding this foliar fungicide crop response information.

[7] **FOLIAR FUNGICIDE RESPONSE – NLB:** Probability of positive yield response to foliar fungicide applications when significant levels of Northern Leaf Blight (NLB) leaf disease is present. **HP** - High Probability; **MP** – Moderate Probability; **LP** – Low Probability. Probabilities based upon product disease scores. Because of the unlimited number of growing environments, cropping practices, and foliar fungicide active ingredients combinations possible, DuPont Pioneer makes no warranty regarding this foliar fungicide crop response information.

The foregoing information is of a general nature and is for informational use only. Please contact your Pioneer sales professional for information and suggestions specific to your operation. Product performance is variable and depends on many factors, including environmental, disease, and pest pressures. Individual results may vary.

AM1 - Optimum® AcreMax® 1 Insect Protection System with an integrated corn rootworm refuge solution includes HXX, LL, RR2. Optimum AcreMax 1 products contain the LibertyLink® gene and can be sprayed with Liberty® herbicide. The required corn borer refuge can be planted up to half a mile away. **AMRW** - Optimum® AcreMax® RW Rootworm Protection system with a single-bag integrated corn rootworm refuge solution includes HXRW, LL, RR2. **AM** - Optimum® AcreMax® Insect Protection system with YGCB, HX1, LL, RR2. Contains a single-bag integrated refuge solution for above-ground insects. In EPA-designated cotton growing counties, a 20% separate corn borer refuge must be planted with Optimum AcreMax products. AMX - Optimum® AcreMax® Xtra Insect Protection system with YGCB, HXX, LL, RR2. Contains a single-bag integrated refuge solution for above- and below-ground insects. In EPA-designated cotton growing counties, a 20% separate corn borer refuge must be planted with Optimum AcreMax Xtra products. **AMXT** (Optimum® AcreMax® XTreme) - Contains a single-bag integrated refuge solution for above- and below-ground insects. The major component contains the Agrisure® RW trait, the YieldGard® Corn Borer gene, and the Herculex® XTRA genes. In EPA-designated cotton growing counties, a 20% separate corn borer refuge must be planted with Optimum AcreMax XTreme products.

RW,HX1,LL,RR2 (Optimum® TRIsect®) - Contains the Herculex I gene for above-ground pests and the Agrisure® RW trait for resistance to corn rootworm. **HX1** - Contains the Herculex® I Insect Protection gene which provides protection against European corn borer, southwestern corn borer, black cutworm, fall armyworm, western bean cutworm, lesser corn stalk borer, southern corn stalk borer, and sugarcane borer; and suppresses corn earworm. **HXRW** - The Herculex® RW insect protection trait contains proteins that provide enhanced resistance against western corn rootworm, northern corn rootworm and Mexican corn rootworm. **HXX** - Herculex® XTRA contains the Herculex I and Herculex RW genes.

YGCB - The YieldGard® Corn Borer gene offers a high level of resistance to European corn borer, southwestern corn borer and southern cornstalk borer; moderate resistance to corn earworm and common stalk borer; and above average resistance to fall armyworm. **LL** - Contains the LibertyLink® gene for resistance to Liberty® herbicide. **RR2** - Contains the Roundup Ready® Corn 2 trait that provides crop safety for over-the-top applications of labeled glyphosate herbicides when applied according to label directions. WH – White food corn.

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