

Northern Corn Leaf Blight and Common Rust in Fresh Market Sweet Corn

Thomas A. Zitter
Department of Plant Pathology and P-M Biology
Cornell University
Ithaca, NY 14853

Sweet corn is widely grown in New York State from large, commercial fresh market acreages, to extensive processing vegetable acreages, to the ever-popular backyard garden plots. The principle foliar diseases are Northern Corn Leaf Blight (NCLB) and Common Rust (CR), and both diseases often occur together. Sweet corn is often grown in the proximity of field corn, so additional information is present for Anthracnose leaf blight, Northern corn leaf spot, Southern corn leaf blight, Eyespot, and Gray leaf spot.

NCLB and CR may not be found every year because their occurrence is influenced by environmental factors (temperature, humidity, and soil moisture), previous cropping histories, and crop location within the state. A lot also depends on the airborne movement of into the area. Sweet corn is one crop where seedborne diseases are not an important factor. Additionally, most corn seed sold is treated with a fungicide/insecticide mixture to reduce the risk of seed rot and seedling blights. Most of the diseases discussed occur sometime after plant establishment.

This report is divided into two sections:

1. List of major foliar pathogens of corn and the conditions favoring each disease, plant parts affected, and control measures.
2. Fungicides labeled in NYS for control of the major foliar pathogens are presented. Because new sweet corn varieties are introduced each year, and some with added disease resistance, the latest seed catalogs should be checked for up-to-date information.

The Most Common Sweet Corn Plant Pathogens in New York State

Disease and causal agent	Plant parts affected	Conditions favorable	Appearance	Dissemination and Survival	Control
Anthracnose leaf blight <i>Colletotrichum graminicola</i> (teleomorph <i>Glomerella graminicola</i>)	Seedling and foliage; esp. in <u>no-till or reduced-till.</u> (Field corn)	Mild & wet conditions; free H ₂ O necessary for spore dispersion and germination.	Small, oval to elongated water-soaked spots on lower leaves; lesions are semi-transparent; spots enlarge, <u>become tan at center with reddish-brown or yellow-orange border</u>	Spores dispersed by wind and <u>splashing rain</u> ; on corn debris and seeds and other grass hosts	Use resistant hybrids and varieties; <u>2-3 yr. rotation important</u> ; plow down crop residue and strive for balanced soil fertility.
Northern corn leaf blight <i>Exserohilum turcicum</i> (<i>Helminth. turcicum</i>) (teleomorph <i>Setosphaeria turcica</i>)	(Sweet Corn & Field Corn); foliage and <u>occasionally ears when severe</u>	Moderate temp. (18-27°C) and heavy dews, <u>typically later in the growing season</u> ; race 1 and 2 most common	<u>Elliptical (cigar shaped) tan lesions 1-6 inches long</u> ; spores produced on underside of leaf below the lesion (dusty green fuzz).	<u>Long distance spread windborne spores</u> ; spread within and between fields locally.	Use resistant hybrids; most resistant to race 1; <u>spraying with fungicides may be necessary.</u>
Northern corn leaf spot <i>Cochliobolus carbonum</i> (syn. <i>Helminth. carbonum</i>) (teleomorph <i>Bipolaris zeicola</i>)	Foliage & ears; <u>more common due to use of no-till systems.</u> (mostly Field corn)	Moderate temperature & <u>high relative humidity</u> ; sporulates abundantly in damp weather	Race 3: <u>Narrow linear lesions up to 1/8 to 1/2 inch long</u> running in a line along leaf vein – called “string of pearls.”	<u>Airborne spores are dispersed long distances from infected fields</u> ; spores o/w in crop debris.	Use of resistant hybrids and varieties; crop rotation.
Southern leaf blight <i>Cochliobolus heterostrophus</i> (syn. <i>Helminth. maydis</i>) (teleomorph <i>Bipolaris maydis</i>)	Foliage, stalks, ears and cobs (Field corn if it occurs).	<u>Warm (20-32°C) & and damp</u>	<u>Race 0 & Race T</u> in good old days	On/in infected plant debris. <u>Dispersed by wind and/or splashing rain</u>	Use corn with normal cytoplasm and <u>resistant hybrids</u> plow down crop debris.
Common corn rust <i>Puccinia sorghi</i>	Mainly on leaves; usually late occurring (Sweet corn and Field corn)	Favored by moderate temp. (60-70F), frequent heavy dews and high nitrogen	Develops soon after silking; <u>oval pustules containing reddish-orange spores occur on both leaf surfaces.</u>	Urediniospores cause reinfection; pustules turn black in fall with winter teliospores; <u>primary inoculum blown up north from southern locations.</u>	<u>White varieties generally more susceptible</u> but some yellow hybrids equally susceptible; choose tolerant varieties and consider <u>fungicide sprays.</u>
Gray leaf spot <i>Cercospora zeae-maydis</i>	<u>Affects foliage sometime after anthesis</u> (Field corn, also sweet corn)	<u>Prolonged periods of dew, fog and cloudy weather</u> ; look for it in Southern Tier, Hudson River Valley & now Mohawk Valley & Leatherstocking Region.	Appears as rectangular lesions, which become tan and then gray in color. <u>The sharp parallel edges and opacity of mature lesions are diagnostic</u>	<u>Common when corn follows corn and diseased crop residues remain on the soil surface.</u>	<u>Hybrids differ in their susceptibility</u> ; Fall burial of crop residues and crop rotations are important.
Eyespot <i>Kabatiella zeae</i>	Leaves and leaf sheathes, outer husks,	<u>Cool & wet weather</u>	Circular to oval lesions, may coalesce; <u>initial translucent water-soaked with margin and halo hence “eyespot”</u>	Overwinters in corn debris; <u>dispersed by wind and splashing rain.</u>	<u>Rarely a target for fungicides.</u>

Sweet Corn Foliar Fungicides labeled in NYS DEC 2012 (T.A. Zitter, Dept. of Plant Pathology P-MB, Cornell University, Ithaca, NY)

Alphabetical for Trade & Common Names; EPA No.	Group No(s)	DTH/ REI hrs	Aerial	Anthraxnose	Northern Corn Leaf Blight (3 blights)	Com. Rust	Gray Lf. Spot	Eyespot	Seasonal limits; Applic. points
Protectants & Single Products									
Bravo WS (<i>chlorothalonil</i>) or OLP; 50534-188-100	M5	14d 12h	YES - do not apply w/in 150 ft. of water body	--	0.75-2 pts./A (3 Blights)	0.75-2 pts./A	--	--	12 pts. ; do not apply to SC for processing; if severe disease, increase to 1.5-2 pts./A.
Dithane F-45 (<i>mancozeb</i>) or OLP; 62719-396	M3	7d 24h	YES - Add surfactant to enhance control	--	1.2 qts. (1 Blight)	1.2 qts.	--	--	18 qt. ; maximum no. of applications/A is 15.
Headline SC (<i>pyraclostrobin</i>) 7969-289	11	7d 12h	YES, except w/in 100 ft. of aquatic habitats	6-12 fl oz; Ins.	6-12 fl oz (3 Blights); VG	6-12 fl oz; E	6-12 fl oz; E	6-12 fl oz; E	72 fl oz ; limit to 2 sequential appl. before alternating to a non-Grp. 11 fungicide.
Quadris F (<i>azoxystrobin</i>) 100-1098	11	7d 4h	YES, NOTE phyto to certain apples	6.0-15.5 fl oz; VG	6.0-15.5 fl oz (3 Blights); G	6.0-9.0 fl oz ; E	6.0-15.5 fl oz; E	6.0-15.5 fl oz; VG-E	123 fl oz ; limit to 2 seq. applic. then rotate to non-Grp. 11 MOA; adjuvant may be added
PropiMax/Tilt / Fitness (<i>propiconazole</i>); 62719-346/100-617	3	14d 12h	YES, Apply and allow to dry before rainfall.	NL	2-4 fl oz (3 Blights); G	4 fl oz; VG	4 fl oz; G	4 fl oz; E	16 fl oz ; for best control apply at early onset of disease.
Proline 480SC (<i>prothioconazole</i>) 264-825	3	0d 12h	Yes, can use min. of 2 gpa.	5.7 fl oz	5.7 fl oz (3 Blights)	5.7 fl oz	5.7 fl oz	5.7 fl oz	22.8 fl oz ; not suggested if crop is under environmental stress.

Alphabetical for Trade & Common & Names; EPA No.	Group No(s)	DTH/ REI hrs	Aerial	Anthrachnose	Northern Corn Leaf Blight (3 Blights)	Com. Rust	Gray Lf. Spot	Eyespot	Seasonal limits; Applic. points
Combination Products									
Headline AMP (SC) (pyraclostrobin + metconazole) 7969-291	11 + 3	7d <hr/> 12h	YES , 24(c), not less than 2 gpa spray volume.	10-14.4 fl oz; Ins.	10-14.4 fl oz (3 Blights); VG	10-14.4 fl oz; E	10-14.4 fl oz; E	10-14.4 fl oz; E	57.6 fl oz ; limit to 2 sequential appl. before alternating to a non-Grp. 11 fungicide.
Quilt or OLP azoxystrobin + propiconazole – (Avaris) (7 & 11.7 % ea.); 100-1178	11 + 3	14d <hr/> 12h	YES , use with crop oil conc.; phyto to certain apple varieties.	10.5-14 fl oz; VG	7-14 fl oz (3 Blights); VG	10.5-14 fl oz; VG-E	10.5-14 fl oz; E	10.5-14 fl oz; E	56 fl oz ; alternate with PropiMax or Tilt or other non-Grp. 11 fungicide.
Quilt Xcel (azoxystrobin + propiconazole) (13.5 & 11.7% ea.) 100-1324	11 + 3	14d <hr/> 12h	YES , use with crop oil conc.; phyto to certain apple varieties.	10.5-14 fl oz; VG	10.5-14 fl oz (3 Blights); VG	10.5-14 fl oz; VG-E	10.5-14 fl oz; E	10.5-14 fl oz; VG-E	56 fl oz ; alternate with PropiMax or Tilt or other non-Grp. 11 fungicide.
Stratego YLD (prothioconazole + trifloxystrobin) 264-1093	11 + 3	0d <hr/> 12h	NO , Use of adjuvant may enhance performance.	4.0-5.0 fl oz; VG	4.0-5.0 fl oz (3 Blights); VG	4.0-5.0 fl oz; E	4.0-5.0 fl oz; E	4.0-5.0 fl oz; VG	20 fl oz ; alternate every spray with a non-Grp. 11 fungicide.

Abbrev.: DTH = days to harvest (PHI); REI = reentry interval; OLP = other label products and formulations are available; MOA = mode of action refers to specific activity of fungicides and rotation is used to prevent resistance from developing for a specific fungicide prone to Fungicide Resistance (ie. Grp 11); gpa = gallons per acre. Efficacy rates from G. Bergstrom & US Corn Dis. Working Group where NL= Not labeled; Ins.= insufficient data; E= Excellent; VG= Very Good