

Corn disease update – 07/31/2023

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The disease known as **Southern rust of corn** was first reported on July 28th in a corn field in Tulsa County, Oklahoma (Figure 1A), with two more corn fields reported in Caddo County on July 31st. This year, Southern rust appears to be moving from eastern to western U.S. states, already reported in Florida, Louisiana, Alabama, and Arkansas, before appearing in Oklahoma. When weather conditions favor rust development, the infection cycle of this disease continually repeats, where the initial infections produce spores that are spread to nearby plants and fields. However, the impact that this disease is going to have in the corn fields is going to depend on several factors that need to be evaluated before making decisions regarding disease management, such as:

- 1) Crop growth stage at the onset of infection:** knowledge of the corn growth state when this disease arrives in the field is crucial for making decisions regarding disease management. Relevant information about the possible benefits that a fungicide application can have to protect the corn crop against Southern rust depending on the growth stage is available in a publication on the Crop Protection Network website (<https://cropprotectionnetwork.org/publications/an-overview-of-southern-rust>). This research shows that the corn fields between the tasseling (VT) to milk growth stage (R3) when Southern rust is first detected may still benefit from a fungicide application if the weather conditions favor disease development. However, corn fields in the late milk, dough stages (R4) and beyond may not economically benefit from the fungicide spray. Although rust can appear in corn fields in late growth stages, yield losses caused by this disease may not be enough to warrant the cost of the fungicide spray.
- 2) Corn hybrid susceptibility:** knowledge of the corn hybrid regarding rust resistance is critical to determine the risk of the crop to yield and profitability losses. Consult your seed dealer to determine if your current hybrids have resistance against Southern rust.
- 3) Weather conditions:** the fungal pathogen that causes this disease, *Puccinia polysora* (Figure 1B), can infect corn plants after approximately six hours of leaf wetness. Despite the lack of rainfall, high relative humidity and long dew hours may provide enough moisture for the pathogen to cause infection. However, this disease is more severe and is more likely to cause yield losses in years with frequent rainfall events. Besides that, Southern rust is favored by temperatures around 80°F (27°C) that are easily reached through the corn growth season in the state.

My first recommendation for Oklahoma growers is to scout fields and look for symptoms of this disease in the corn leaves. The pathogen that causes this disease produces raised structures on the corn leaf surface called **pustules** that are orange to light brown in color, circular to oval in shape, and frequently surrounded by a light green halo (Figure 1A). I also recommend that the growers take notes regarding the position of the symptoms in the corn plant to identify where they are located, in the lower canopy (below ear leaf) or upper canopy (upper part of the plant). After that, leave samples presenting symptoms of the disease should be sent to the Plant Disease and Insect Diagnostic Laboratory at Oklahoma State University (<https://agriculture.okstate.edu/departments-programs/entomol-plant-path/research-and-extension/plant-disease-insect-diag-lab/>) since Southern rust can be mistaken with Common rust, a disease that is frequently observed in corn fields but is unlikely to cause yield losses.

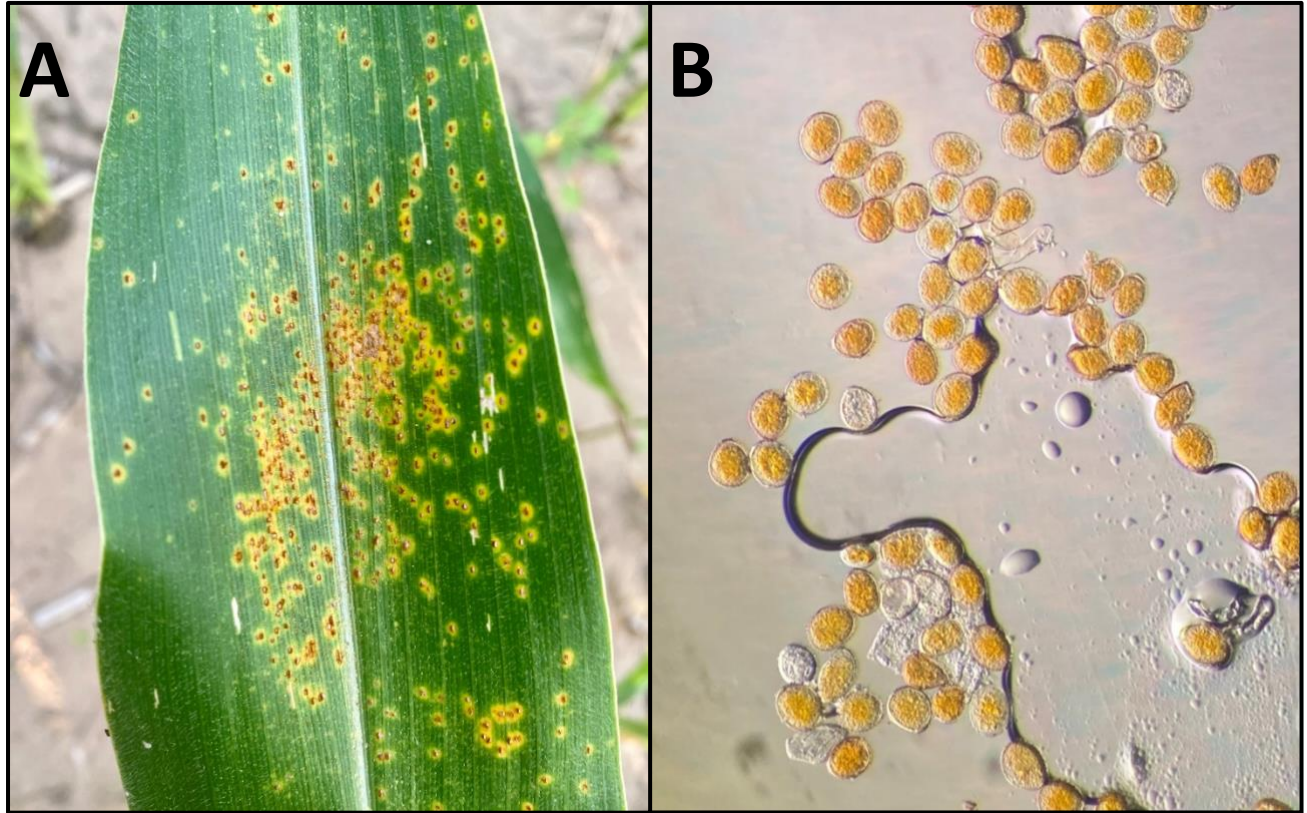


Figure 1: A) Southern rust pustules on the upper surface of the corn leaf. **B)** Southern rust spores called urediniospores observed under the microscope.

Another valuable resource that the corn growers have available is the Fungicide Efficacy for Control of Corn Diseases available in a publication on the Crop Protection Network website and presented here in Table 1 (<https://cropprotectionnetwork.org/publications/fungicide-efficacy-for-control-of-corn-diseases>). This publication is updated annually, reporting the efficacy of the available fungicides to manage foliar diseases in corn, determined by field testing over multiple years and locations.

If you are curious to know if Southern rust is developing and moving across the U.S. corn production regions, we have an excellent website to track the disease's spread in real-time (<https://agpestmonitor.org/visualize/map.cfm?id=14>). The counties in each state marked in red are where Southern rust was already reported this year.



Fungicide mode of action groups:

- Group 11 QoI Strobilurins
- Group 3 DMI Triazoles
- Group 7 SDHI

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 Efficacy for Control of Corn Diseases Table (05/2023)

	Active ingredient (%)	Product/Trade name	Rate/A (fl oz)	Anthraxnose leaf blight	Common rust	Eyespot	Gray leaf spot	Northern corn leaf blight	Southern rust	Tar spot ¹	Harvest restriction ²
11	Azoxystrobin 22.9%	Quadris 2.08 SC, multiple generics	6.0 – 15.5	VG	E	VG	E	G	VG	NL	7 days
	Pyraclostrobin 23.6%	Headline 2.09 EC/SC	6.0 – 12.0	VG	E	E	E	VG	VG	NL	7 days
	Picoxystrobin 22.5%	Aproach 2.08 SC	3.0 – 12.0	VG	VG-E	VG	F-VG	VG	G	G ³	7 days
3	Flutriafol 20.9%	Xyway LFR 1.92 SC	LFR: 5.8 – 15.2	NL	U	NL	G	VG	NL	NL	N/A
	Flutriafol 26.4%	Xyway 3D 2.5 SC	3D: 5.8 – 11.8								
	Propiconazole 41.8%	Tilt 3.6 EC, multiple generics	2.0 – 4.0	NL	VG	E	G	G	F	NL	30 days
	Prothioconazole 41.0%	Proline 480 SC	5.7	U	VG	E	U	VG	G	NL	14 days
	Tebuconazole 38.7%	Folicur 3.6 F, multiple generics	4.0 – 6.0	NL	U	NL	U	VG	F	NL	36 days
	Tetraconazole 20.5%	Domark 230 ME	4.0 – 6.0	U	U	U	E	VG	G	G ³	R3 (milk)
11	Azoxystrobin 13.5%	Quilt Xcel 2.2 SE, multiple generics	10.5 – 14.0	VG	VG-E	VG-E	E	VG	VG	NL	30 days
3	Propiconazole 11.7%										
7	Benzovindiflupyr 2.9%	Trivapro 2.21 SE	13.7	U	U	U	E	VG	E	G-VG	30 days
11	Azoxystrobin 10.5%										
3	Propiconazole 11.9%	Aproach Prima 2.34 SC	3.4 – 6.8	U	U	U	E	VG	G	G-VG ³	30 days
3	Cyproconazole 7.17%										
11	Picoxystrobin 17.94%										
3	Flutriafol 19.3%	Fortix 3.22 SC	4.0 – 6.0	U	U	U	E	VG	VG	G-VG ³	30 days
11	Fluoxastrobin 14.84%										
3	Flutriafol 26.47%	Lucento	3.0 – 5.5	U	U	U	VG-E	VG	VG	G ³	30 days
7	Bixafen 15.55%										
3	Flutriafol 18.63%	TopGuard EQ	5.0 – 7.0	U	F	U	VG	G-VG	G-VG	G-VG ³	45 days
11	Azoxystrobin 25.30%										
3	Mefentrifluconazole 17.56%	Veltyma	7.0 – 10.0	U	U	U	VG-E	VG-E	VG	VG	21 days
11	Pyraclostrobin 17.56%										
3	Mefentrifluconazole 11.61%	Revytek	8.0 – 15.0	U	U	U	VG-E	VG-E	VG	VG	21 days
7	Fluxapyroxad 7.74%										
11	Pyraclostrobin 15.49%	Delaro325 SC	8.0 – 12.0	VG	E	VG	E	VG	G-VG	G-VG	14 days
3	Prothioconazole 16.0%										
11	Trifloxystrobin 13.7%										
3	Prothioconazole 14.9%	Delaro Complete 3.83 SC	4.0 – 12.0	U	U	U	E	VG	G-VG	VG	14 days
7	Fluopyram 10.9%										
11	Trifloxystrobin 13.1%	Miravis Neo 2.5 SE	13.7	U	U	U	E	VG-E	VG	G-VG	30 days
7	Pydiflumetofen 7.0%										
11	Azoxystrobin 9.3%										
3	Propiconazole 11.6%	Priaxor 4.17 SC	4.0 – 8.0	U	VG	U	VG	VG-E	VG	NL	21 days
11	Pyraclostrobin 28.58%										
7	Fluxapyroxad 14.33%	Headline AMP 1.68 SC	10.0 – 14.4	U	E	E	E	VG	G	G-VG	20 days
11	Pyraclostrobin 13.64%										
3	Metconazole 5.14%										
11	Trifloxystrobin 32.3%	Stratego YLD 4.18 SC	2.0 – 5.0	VG	E	VG	E	VG	G	NL	14 days
3	Prothioconazole 10.8%										
3	Tetraconazole 7.48%	Affiance 1.5 SC	10.0 – 14.0	U	G-VG	U	G-VG	G-VG	G	G ³	7 days
11	Azoxystrobin 9.35%										
3	Flutriafol 15.7%	Adastrio 4.0 SC	7.0 – 9.0	U	U	U	U	U	VG	U ³	30 days
11	Azoxystrobin 15.7%										
7	Fluindapyr 10.5%										

Indicates product with mixed fungicide classes

¹Fungicide application timing is extremely important and needs to be made near the onset of the tar spot symptoms. Efficacy ratings based on limited site locations from 2018 to 2022. ²Harvest 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. ³A 2ee label is available for several fungicides for control of tar spot, however efficacy data are limited. Check 2ee labels carefully, as not all products have 2ee labels in all states. 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.