



CEREAL RUST BULLETIN

Issued by:

Cereal Disease Laboratory

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- Severe wheat stem rust in research plots was reported in three out of nine states where the disease occurred in 2023.
- Wheat leaf rust was observed in 23 states across the U.S. and was severe in growers' farms in the Southeast.
- Wheat stripe rust infection was late in the season, and disease severity was low in most states.
- Oat stem rust was reported in Texas, Louisiana, Mississippi, and Florida.
- Oat crown rust was widespread and severe in Georgia.
- Barley stem rust was found in Alabama and Minnesota.
- Severe barley leaf rust was observed in barley nursery at Texas, Virginia, and Washington.
- Barley stripe rust occurred in Washington and Arizona.
- Rye stem rust and rye leaf rust were found in Minnesota.
- *Thank you to all our cooperators for rust reports and collections!*

For original, detailed reports from our cooperators and CDL staff, please visit the [Cereal Rust Situation](#) (CRS) reports page on the [CDL website](#).

Wheat stem rust. Wheat stem rust was reported in nine states across the U.S. and generally at low incidence and severity in the central and northern Plains. Disease severity was high in naturally infected research plots in Texas, Louisiana, and Oklahoma. Race QFCSC, the dominant race in the United States, was common in all stem rust samples processed at the Cereal Disease Laboratory.

Texas – Wheat stem rust was first detected on April 11 at the naturally inoculated rust nursery in Castroville, Medina County. Severity and incidence were up to 80% on susceptible cultivar Morocco. The disease was present on the stem, leaf, and head. Wheat had completed the heading growth stage during observation. Stem rust was present in commercial fields in Burlinson, Hunt, and Moore counties. Wheat stem rust samples were identified as race QFCSC.

Louisiana – The first wheat stem rust in Louisiana was observed at the Baton Rouge nursery on April 10. The wheat crop was at the ripening growth stage. By April 28, stem rust was severe on susceptible varieties at the Louisiana State University nursery in Baton Rouge. Low levels of stem rust were found in the experimental plots in Winnsboro on May 4. Races QFCSC and MCCDC were identified from the stem rust samples collected.

Oklahoma – On May 22, high wheat stem rust pressure was observed on variety LCS Galloway AX and a few breeding lines at the Oklahoma State University Research Station in Chickasha, Grady County.



Kansas – Wheat stem rust was first detected on varieties LCS Atomic AX, LCS Galloway, and Crescent AX on June 2 in Lane and Thomas counties — western and northwest regions of Kansas, respectively. By mid-June, low to moderate stem rust incidence was observed on susceptible varieties in Republic, Wallace, Riley, Jewell, and Decatur counties in the north-central, western, and northwest regions. The wheat crop was at the milk and early dough growth stages. Races QFCSC and RKRQC were identified from the rust samples.

Colorado – The Cereal Disease Laboratory received a wheat stem rust sample from Washington County and was determined to be race QFCSC.

Nebraska – Low stem rust was found in the wheat breeding plots at Sidney, Cheyenne County.

South Dakota – Trace levels of wheat stem rust were reported in growers' fields and breeding nurseries in the central and south-central parts of the state.

North Dakota – Trace levels of wheat stem rust were observed on susceptible spring wheat cultivars in east-central North Dakota.

Minnesota – On July 11, wheat stem rust was found in the sentinel plots of the yield trials in the Sand Plains Research Farm east of Becker, east-central MN. Disease incidence was at a trace level, but severity ranged from moderate to high on susceptible cultivars. Similar stem rust level was present in the sentinel plots in the trial west of Montgomery, south-central MN. Trace levels of wheat stem rust were reported on susceptible spring wheat cultivars in northwest Minnesota.

Wheat stem rust races identified to date from the 2023 collections.

Race	State	Host	Cultivar
QFCSC	TX	Hard red spring wheat	Experimental
QFCSC	TX	Soft red winter wheat	USG 3536
QFCSC	TX	Soft red winter wheat	SY 747
QFCSC	TX	Soft red winter wheat	Dyna-Gro 9701
QFCSC	TX	Soft red winter wheat	Blackland 2255
MCCDC	LA	Unknown wheat type	FFR520
QFCSC	LA	Unknown wheat type	
QFCSC	OK	Winter wheat	RGON2022: TX18DH85
QFCSC	OK	Winter wheat	OK21DTR1704-37
QFCSC	OK	Winter wheat	RGON 2022: TX20A001041
QFCSC	KS	Hard red winter wheat	LCS Atomic AX
QFCSC	KS	Hard red winter wheat	KS19H10
RKRQC	KS	Hard red winter wheat	LCS Atomic AX
QFCSC	KS	Hard red winter wheat	T 158
QFCSC	KS	Hard red winter wheat	AP Roadrunner
QFCSC	CO	Hard red winter wheat	
QFCSC	NE	Winter wheat	
QFCSC	AL	Unknown barley type	Greg
QFCSC	ND	Hard red spring wheat	CP3099A
QFCSC	MN	Hard red spring wheat	Morocco
QFCSC	MN	Hard red spring wheat	CP3099A

Wheat stem rust collection map. Please visit: <http://www.ars.usda.gov/Main/docs.htm?docid=9757>

Wheat leaf rust. Wheat leaf rust was observed in 23 states across the U.S. in 2023. Leaf rust was widespread and severe in the wheat-growing regions in Georgia, South Carolina, North Carolina, and Virginia. In the Midwest, the disease was generally low and developed late in the growing season. The prolonged drought conditions in most states suppressed infection and spread of leaf rust throughout the Great Plains.

Texas – Low levels of leaf rust were observed at the Castroville nursery, southwest TX, on March 6. By mid-March, virulence to *Lr24* was spreading faster than virulence to *Lr39/41*, and this was consistent with observations in the previous years. Severity and incidence increased significantly by the second week of April, and flag leaves were fully covered. Hard red winter Jagalene carrying *Lr24* and *Lr37*, and TAM112 with *Lr39/41* were rated 100S. Similarly, high levels of wheat leaf rust were observed on several genotypes used in the sentinel plots in Weslaco and a nursery in McGregor, south and east-central TX, respectively. On April 27, wheat leaf rust was found in only two of the six winter wheat fields scouted in Wharton County, southeast TX. The disease was moderate to high in the unsprayed portion of the growers' fields. The wheat crop was at mealy ripe to kernel hard growth stages. Leaf rust was severe on Triticale planted as windbreaks in a vegetable field in Victoria, southeast TX.

Oklahoma – Wheat leaf rust was first reported in Oklahoma on May 10 at a trace level in the OSU research plots at Stillwater, Payne County. Although disease incidence and severity had increased by May 22, rust pressure was still low at this location. Severe leaf rust was observed on some varieties at the Chickasha trial plots. Low levels of leaf rust were reported in Morris, Okmulgee County, on May 16.

Kansas – Leaf rust was observed at multiple locations but developed late in the season, thus posing no threat to crop yields.

Colorado – Trace level of leaf rust was reported in Kit Carson County in the third week of May.

Nebraska – Wheat leaf rust arrived late in the growing season and did not develop to damaging levels.

South Dakota – Late-season leaf rust was seen on winter wheat in eastern South Dakota in the second week of July. Low levels of leaf rust were reported in central and southcentral parts of the state.

North Dakota – On July 11, a few pustules of wheat leaf rust were found in winter wheat at the North Dakota State University Hettinger Research Extension Center in the southwest part of the state. During a cereal rust survey conducted by the Cereal Disease Laboratory staff in the last week of July, only trace levels of leaf rust were observed on susceptible wheat cultivars in eastern and central North Dakota. The disease was present on a few hard red spring wheat cultivars with *Lr21* at trace levels. Leaf rust was present at very low incidence and severity due to dry weather in the Dakotas. Drought conditions in the winter wheat regions of the southern Great Plains reduced the amount of initial leaf rust inoculum that arrived in the northern Plains.

Minnesota – During the cereal rust survey at the University of Minnesota Southern Research Centers on July 10, leaf rust was at trace levels in plots of the susceptible cultivar Morocco in Waseca County in south central Minnesota, and leaf rust was not found on Morocco in Redwood County in the southwest part of the state. At both locations, spring wheat variety trials were free of rust pustules. According to Dr. Jim Kolmer, 2023 had the lowest leaf rust in southern MN during the second week of July compared to the previous years. Trace levels of leaf rust incidence was observed in the sentinel plots of the yield trials east of Rochester, Olmsted County, and west of Montgomery. In the last week of July, wheat leaf rust was observed at trace levels on susceptible wheat cultivars in northwest Minnesota.

Illinois – Up to 10% severity and 1% incidence of natural leaf rust were found in wheat trial plots at the University of Illinois Champaign research fields. Wheat ranged from soft to hard-dough growth stages.

Indiana – Low incidence but 5–50% severity of wheat leaf rust was present in the Purdue University Agricultural Center for Research and Education site near West Lafayette. Wheat ranged from late milk to early soft dough.

Ohio – Leaf rust was at approximately 30% incidence and 10–60 % severity at the Ohio State University Agricultural Research and Development Center station near Hoytville, but the disease severity ranged from 5 to 100% at the research station in Wooster. Leaf rust was found in one private field within a half mile of the OARDC site near Hoytville. Wheat ranged from late milk to early soft dough.

Michigan – The Cereal Disease Laboratory received a wheat leaf rust collection from Ingham County in early July.

Louisiana – Initial wheat leaf rust infection was minimal at the Baton Rouge and Winnsboro nurseries but began to progress quickly on susceptible varieties in early April as the conditions for the disease became favorable. By the end of April, the disease had progressed to very severe on susceptible winter wheat and a few Triticale lines at both locations. In contrast, wheat leaf rust severity was low to moderate on a few susceptible varieties at the Louisiana State University research nurseries in Bossier City, Alexandria, and Crowley. The wheat crop was at mealy ripe growth stage.

Mississippi – Wheat leaf rust was present on a few susceptible lines at the Mississippi State University Experiment Station in Beaumont, Perry County. The disease incidence was high, and the severity ranged from moderate to high. Low levels of wheat leaf rust were found in Raymond, Hinds County, on April 28. The wheat crop was at the milky ripe growth stage.

Alabama – In early April, moderate incidence with low to moderate severity of leaf rust were found on different varieties in trials at Brewton, Escambia County. In late April, wheat leaf rust was observed at moderate severity on a susceptible line at the Auburn University experimental plots in Fairhope, Baldwin County and the variety trials at Headland, Henry County. Trace levels of the rust was present in the variety trials at Prattville, Autauga County.

Georgia – Wheat leaf rust was detected earlier in the season compared to previous years. Widespread leaf rust was common in southwest and central-east Georgia in mid-March. Moderate severity but high incidence leaf rust was reported on the breeding line at Plains Nursery in west-central GA on March 31. The wheat growth stage was at the ligule of the flag leaf visible. Weather conditions in the state changed to a cooler temperature in April, preventing new leaf rust infection.

South Carolina – Wheat leaf rust was widespread and moderately severe this year in the state.

North Carolina – Wheat leaf rust epidemic was reported in North Carolina, especially in the eastern region. About one-third of the counties where wheat was grown had leaf rust this year. The disease developed late in the season after wheat had headed, hence, had little to no impact on yield.

Virginia – Wheat fields in the eastern shore area of the state had severe leaf rust late in the season, but only a few lesions were present in Virginia's northern neck. The Cereal Disease Lab received four wheat leaf rust collections from Nottoway and Accomack counties. The disease incidence and severity ranged from moderate to high during sampling. The wheat crop was at the mealy ripe growth stage.

Kentucky – Low levels of wheat leaf rust were observed in research trials at Logan County in mid-May.

Maryland – The Cereal Disease Lab received four wheat leaf rust collections from Howard and Prince counties in early June.

New York – Wheat fields in central and eastern New York were surveyed during the week of June 5. Only a trace incidence of leaf rust was seen in a wheat breeding plot in Ithaca, Tompkins County. All commercial fields visited were free of rust. On June 30, leaf rust was found on susceptible winter wheat in variety plots in Ithaca. The wheat crop was at the late dough stage.

Washington – Severe leaf rust was reported in germplasm screening nurseries at Mount Vernon, Skagit County. According to Dr. Xianming Chen, the level of wheat leaf rust was higher than those observed in the last five years.

Wheat leaf rust collection map. Please visit: <http://www.ars.usda.gov/Main/docs.htm?docid=9757>

Wheat cultivar *Lr* gene postulation database.

Please visit: [Leaf rust resistance gene postulation in current U.S. wheat cultivars](#)

Wheat stripe rust. The recently concluded growing season was an unusual year with unfavorable conditions for *Puccinia striiformis* infection. This led to late infection and disease development, hence limited the fungus progression to a less damaging level. Disease severity was low in most states. A few hot spots of wheat stripe rust occurred in Texas, Oklahoma, and New York. High disease severity was reported in nurseries in Washington and Montana.

Texas – Hot spots of wheat stripe rust were found in the mid to upper canopy of susceptible soft red winter Patton on March 6 in Castroville. The disease did not progress when the site was revisited on March 15, and stripe rust was no longer active by April 11.

Oklahoma – Wheat stripe rust was first reported in plots at the OSU Research Station in Chickasha. Severity and incidence were generally low, but there were a few hot spots. Wheat tours in the last week of April covered southwestern Oklahoma (Tipton and Altus counties), south-central Oklahoma (Walters), and central Oklahoma (Apache and Chickasha). Stripe rust had increased from approximately 5% to 15% severity on variety Pete at the Chickasha station. There was no report of stripe rust from other cities visited. Low levels of stripe rust were observed in Lahoma (north-central OK). Wheat growth stages ranged from heading to flowering. A few wheat stripe rust lesions were observed in the OSU research plots at Stillwater in early May.

Kansas – On May 9, trace levels of wheat stripe rust were reported in irrigated wheat fields in Edwards County. By the second week of June, stripe has increased significantly across the state from a few counties reported in May to 27 counties. Kansas experienced prolonged drought conditions from the start of the 2023 growing season to April. Trace stripe rust was first found in May as the state began to receive drought-relieving showers. Stripe rust became established in mid-June as the wheat crop approached heading and flowering growth stages in the west-central and northwestern regions. At these locations, the disease reached 100% incidence and 10-30% severity in the upper canopy of susceptible varieties. Elsewhere, severity was generally low, and rust was restricted to the lower leaves. According to Dr. Erick DeWolf's observations, varieties' responses to stripe rust this season were consistent with those of the previous years, suggesting there were no changes over these years in the virulence of the *Puccinia striiformis* population on sources of genetic resistance in the state.

Nebraska – Wheat stripe rust was first reported in the state during the second week of June and confirmed in six counties in the west-central, southwest, and southern Panhandle of Nebraska. Showers and cool temperatures in these regions favored stripe rust development. Late arrival of the rust would limit its impact on yield. Wheat crop was at soft dough growth stage.

South Dakota – Trace levels of stripe rust were reported in breeding nurseries in the central and south-central parts of the state.

Montana – Severe stripe rust infection was found in the experimental variety in Kalispell, Flathead County, on July 6.

Washington – Wheat stripe rust severity and incidence were high as usual in the wheat nurseries at Mount Vernon, western Washington. The disease was up to 80% severity on susceptible varieties by April 26. The wheat growth stage was at Feekes 6. Winter wheat fields in Benton, Walla Walla, Columbia, and Garfield counties in eastern WA, were surveyed on April 28. A similar survey covering fields in Whitman, Garfield, Columbia, Walla Walla, Franklin, and Adams counties was conducted on May 16. There was no rust in the commercial and experimental fields scouted during both surveys. Except for 2022, stripe rust usually appears in early March in the rust monitoring nursery at Walla Walla County. Natural *Puccinia striiformis* infection was late for the second consecutive year at this location. Only one stripe of the fungus, less than 1 inch long, was found in susceptible spreader rows of winter wheat in Walla Walla on June 12. Trace stripe rust was reported in spreader rows of winter wheat plots in Ferry, Garfield County. There is no report of stripe rust in commercial fields.

Oregon – About 60% severity of stripe rust was reported in winter wheat under irrigation in the rust monitoring nurseries at Hermiston. Winter wheat was at the soft dough growth stage.

Louisiana – Wheat stripe rust was first seen in Louisiana on May 4 in the Winnsboro nursery. The disease severity and incidence were very low.

Mississippi – The first stripe rust in the state was found in a commercial wheat field in Tunica County in the last week of April.

Virginia – Low levels of wheat stripe rust were reported in the state.

New York – On June 5, a localized stripe rust epidemic was observed in three growers' fields in Yates County. In one of these fields, with organic production of a heritage wheat variety, the disease had progressed to the flag leaves by anthesis. The level of stripe rust was probably due to local inoculum from overwintering *Puccinia striiformis* in the field. A trace level of stripe rust was seen on winter wheat in Ithaca wheat variety plots on June 30.

Ohio – Stripe rust was observed in a single field in Wooster out of the 28 wheat fields scouted in the Ohio Valley region. Severity was between 5–30%, and incidence was approximately 5%.

Stripe rust observation map. Please visit: <http://www.ars.usda.gov/Main/docs.htm?docid=9757>

Oat stem rust. Oat stem rust was reported in Texas, Louisiana, Mississippi, and Florida. Race TGN was common in oat stem rust samples collected from these states. This race is virulent on *Pga* but avirulent on *Pg9* and *Pg13* and has been the dominant race in the last two years in the United States.

Texas – Oat stem rust was observed at low severity and incidence at the Castroville nursery in late March but became severe and uniform across the nursery by April 11. Severity and incidence increased to 80% or more.

Louisiana – Oat stem rust was severe at the Baton Rouge nursery, but low levels were reported in the Winnsboro nursery and the LSU experimental plots in Bossier City and Alexandria.

Mississippi – A few stem rust pustules were found on border rows of a commercial field in Adams County on April 28.

Florida – Stem rust was observed on multiple oat lines at different nurseries in Marion County on April 20.

Oat stem rust races identified to date from the 2023 collections.

Race	State	Host	Cultivar
TGN	TX	Winter oat	Coker 227
TGN	TX	Winter oat	TAMO 111
SGD	TX	Winter oat	TAMO 111
TGN	TX	Winter oat	Gerald 224
TQL	TX	Spring oat	
TJS + TGN	TX	Spring oat	
TGN	TX	Spring oat	
TGN	LA	Spring oat	#331
TJS+	LA	Spring oat	
TGN	LA	Unknow oat type	#124
TJS+	LA	Unknow oat type	
TGN	MS	Spring oat	
TGN	FL	Unknow oat type	Pg 6
TGN	FL	Unknow oat type	Rdny-Pg1
TGN	FL	Unknow oat type	PI 76809-1
TGN	FL	Unknow oat type	PI 266277-1
TGN	FL	Spring oat	CI 8250 Kyto
TGN	FL	Spring oat	PI 138694-1
TGN	FL	Spring oat	CIav 2346-2
TGN	FL	Spring oat	PI 64342-1
SDN	SD	Unknow oat type	
TGN	SD	Unknow oat type	

Oat stem rust collection map. Please visit: <http://www.ars.usda.gov/Main/docs.htm?docid=9757>

Oat crown rust. Oat crown rust was widespread and severe in Georgia, but severity varied in other states where the disease occurred.

Texas – Crown rust was severe in nurseries at Castroville and Weslaco. Varieties Rodney, Coker 227, and Marvelous were rated 80–100S. In contrast, the disease ranged between 1–20% severity and incidence in the nursery at College Station.

Louisiana – Oat crown rust was severe on susceptible cultivar Brooks in the Baton Rouge nursery, South LA but low in Winnsboro, North LA, by the third week of April. During the April 28 survey, oat crown rust was up to 80% severity on a few susceptible varieties at the Bossier City nursery, North LA and up to 30S at the research plots in Alexandria, Central LA. Crown rust was widespread and severe on many oat lines in the Baton Rouge nursery.

Mississippi – Oat crown rust at 100% incidence and 25% severity was observed at the research plots in Beaumont, Perry County. Trace levels of crown rust were found in the unsprayed portion of a commercial field in Adams County.

Alabama – Crown rust was widespread and up to 80% severity in the experimental plots in Fairhope, Baldwin County. The disease was up to 100% incidence and 50% severity in the variety trials at Headland but about 20% incidence and 1% severity in the variety trials at Tallassee, Elmore County.

Georgia – Oat crown rust was widespread and severe in many counties, especially in the south and central part of the state. Growers usually apply fungicides on oat and wheat to control diseases.

Florida – Crown rust was detected in mid-February. The disease appeared around a month earlier compared to previous years due to excessively high temperatures in the region. Crown rust progressed rapidly within five to six weeks, and severity ranged from 0–100% depending on the variety. Some varieties were immune, and some were killed by the last week of March before heading. Thirty-one oat crown rust collections of different varieties/lines were received at the Cereal Disease Laboratory from the uniform winter oat trial plots in Gainesville, Alachua County. Varieties with high severity include Brooks, Marvelous, PC-14, 36, 38, 39, 40, 55, 56, and 68. Oat crown rust was observed on volunteer oat lines growing in a wheat field in Jay, Santa Rose County.

South Dakota – The Cereal Disease Laboratory received an oat crown rust sample from Brookings County in early July.

Minnesota – In early June, trace oat crown rust was found at the University of Minnesota research plots in St. Paul, Ramsey County. By the second week of July, up to 25% incidence of oat crown rust was observed in the sentinel plots of the yield trials east of Rochester, west of Montgomery, and east of Becker. Crown rust was present in plots of susceptible Marvelous at the University of Minnesota Southern Research Centers. *Puccinia coronata* infected many varieties, including Reins and SD-Buffalo, at the University of Minnesota west-central research plots in Fergus Falls. Disease incidence was up to 5 %, but severity ranged from moderate to high. Oat was at watery ripe to late milk growth stages.

Oat crown rust collection map. Please visit: <http://www.ars.usda.gov/Main/docs.htm?docid=9757>

Barley stem rust.

Minnesota – On July 11, barley stem rust was observed in the sentinel plots in the trial west of Montgomery.

Alabama – Barley stem rust was found in a commercial field in Limestone County, and disease level ranged from 1–20%. Barley was at ripening growth stage. The stem rust sample from this location was identified as race QFCSC.

Barley leaf rust.

Texas – Leaf rust at 80% severity and incidence was present on a spring barley variety at the Castroville nursery in mid-April.

Virginia – Samples of infected varieties Wysor and Thoughtbred from Accomack and Nottoway counties were received at the Cereal Disease Laboratory in May. Barley leaf rust was at 50–70% severity and incidence during sampling. Barley was at the ripening growth stage.

Maryland – The Cereal Disease Laboratory received a barley leaf rust collection from Maryland.

New York – On June 19, a few pustules of barley leaf rust were found on a breeding line in the Ithaca research plot. About three weeks later, trace levels of leaf rust were observed on spring barley variety trials in Ithaca and in border plots in the Cornell winter cereal variety trial in Scottsville, Monroe County. Barley was at the milky ripe growth stage.

Washington – Severe barley leaf rust was observed in the germplasm screening nurseries at Mount Vernon on June 7.

Barley stripe rust. In mid-June, stripe rust was up to 80% severity on winter barley varieties and up to 40% severity on spring barley varieties in nurseries at Mount Vernon, Washington. The disease was also reported in Arizona.

Rye stem rust.

Texas – Cereal Disease Laboratory received stem rust on spring rye Prolific from a sentinel plot in Weslaco, Hidalgo County.

Minnesota – Rye stem rust was found in the sentinel plots of the yield trials in Becker, Sherburne County.

Rye leaf rust. Rye leaf rust was found in the sentinel plots of the research trials east of Rochester, Minnesota.

Alternate host. Crown rust aecia at moderate incidence and severity was present on buckthorn (*Rhamnus cathartica*) in central and western New York and in Minnesota in May.

Thank you!

This is the final Cereal Rust Bulletin for 2023. We, members of the Cereal Disease Laboratory, would like to thank our collaborators for timely observations, disease updates, and sample collections for race typing. The annual Cereal Rust Survey and Cereal Rust Bulletin wouldn't have been possible without our collaborators' assistance, and we look forward to continued collaboration. The names of those who worked with us, and their corresponding states of observations and collections are listed below. We apologize if you are a submitter, and by oversight, we did not include your name.

Sincerely,
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USDA-ARS Cereal Disease Laboratory.

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