



CEREAL RUST BULLETIN

Issued by:

Cereal Disease Laboratory

U.S. Department of Agriculture
Agricultural Research Service
1551 Lindig St, University of Minnesota
St. Paul, MN 55108-6052
(612) 625-6299
FAX (651) 649-5054
oluseyi.fajolu@usda.gov

For the latest cereal rust news from the field, subscribe to the cereal-rust-survey listserv. To subscribe, please visit:

<http://www.ars.usda.gov/Main/docs.htm?docid=9970>

Or, send an email to: oluseyi.fajolu@usda.gov

Reports from this list as well as all Cereal Rust Bulletins are maintained on the CDL website (<http://www.ars.usda.gov/mwa/cdl>)

- Wheat stem rust was reported only in South Dakota during the 2022 growing season.
- Wheat leaf rust was generally low in most states and at a moderate level on susceptible cultivars.
- Wheat stripe rust was severe in the Pacific Northwest and Georgia but limited in most parts of the Great Plains.
- Oat stem rust samples from South Dakota, Florida, and Louisiana were race-typed as TGN.
- Oat crown rust was observed on resistant cultivars in New York.
- Low level of barley leaf rust was seen in South Dakota and Virginia.
- Barley stripe rust was reported in Washington and California.
- Rye stem rust was reported from New York at varying severity levels.
- Rye leaf rust was observed in Texas and California.
- *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. In early July, stem rust at 100% incidence and 60 – 70% severity was found in plots of susceptible soft white wheat varieties Whitetail, Jupiter, and Jasper in a nursery at Brookings, South Dakota. Wheat stem rust was not reported elsewhere in the country during the 2022 growing season. Rust collections were sent to the Cereal Disease Laboratory.

Wheat leaf rust. Leaf rust was limited in the major wheat-growing states due to drought conditions. A report from Kansas indicated dry and warm weather conditions as the leading factors influencing wheat yield potential in the state in 2022. In Oklahoma, crop damage due to drought stress was noticeable after wheat heading. Dry weather in the Great Plains impacted the amount of inoculum received in the North. In some locations, leaf rust was at moderate to high levels on susceptible cultivars, but the disease developed late in the season.

Texas – On March 2, a few scattered wheat leaf rust pustules were found on the lower canopy of winter wheat Jagalene and TAM 110 at the rust evaluation nurseries in Uvalde and Castroville, south TX. The weather at Castroville was dryer than usual, stressing plants, but irrigation of the rust nursery alleviated the drought stress. By the end of March, leaf rust had moved to the mid-canopy of susceptible genotypes at both locations. In early April at Castroville, virulence to Lr24 was rated 40S in the lower and 20S upper canopy and spread faster than virulence to Lr39/41 or



Lr21. Leaf rust severity was higher at McGregor in central TX, where susceptible varieties were rated 90S on the flag leaves. Wheat growth stages were at Feekes 6 to 10. The wheat crop was very late compared to last year.

Oklahoma – Wheat leaf rust was first observed this year in Oklahoma during the second week of May in the Stillwater Agronomy Research Station, Payne County. Disease pressure was low on susceptible variety OK Bullet and OSU breeding lines. Leaf rust appeared late in the season and at low levels compared to the previous year due to drought conditions experienced in the state. Early May shower provided favorable environmental conditions for *Puccinia triticina* infection. On May 16, leaf rust was found on hard red winter wheat Baker's Ann in Morris, Okmulgee County.

Kansas – Low levels of leaf rust were found in multiple counties at less than 10% severity on flag leaves. The disease appeared in early June, very late in the growing season, when the wheat crop was moving through grain filling stages. According to Dr. Erick DeWolf at Kansas State University, wheat rust diseases in the state were below average relative to the past ten years.

South Dakota – Wheat leaf rust was first reported on June 22 in Brookings County at low severity and incidence. Little to no rust observations were made during the state-wide small grain rust survey conducted in July. Over 50 wheat fields in multiple counties were scouted. Only scattered wheat leaf rust was seen on the susceptible spring wheat Morocco at Campbell County. According to Dale Anderson, Department of Agriculture South Dakota, this year had the lowest cereal rust he had ever seen during a state survey.

North Dakota – Low levels of wheat leaf rust were reported from Cass and Hettinger counties in mid-July. In the first week of August, plots of hard red spring wheat cultivars in eastern and central North Dakota had leaf rust at low to moderate severity. Only a trace level was observed in the northeastern part of the state.

Minnesota – On July 5, low to moderate leaf rust severity was observed on susceptible winter wheat at the University of Minnesota research fields in Ramsey County. Plants were senescing due to the hot and dry weather. Wheat leaf rust was found at moderate to high severity levels in plots of Morocco in southern and southwestern Minnesota on July 20. Light infection of *Puccinia triticina* was seen on spring wheat cultivars grown in Minnesota and North Dakota. In the last week of July, leaf rust in research plots in west central Minnesota was at a moderate and low severity on soft white and hard red spring wheat cultivars, respectively. The susceptible cultivar Morocco plots had dried down completely. In northwest Minnesota, leaf rust was at trace to moderate levels on hard red spring wheat. The cultivar Prosper with Lr21 had a moderate leaf rust infection. The susceptible cultivars Morocco and Thatcher were highly infected with leaf rust.

Michigan – Wheat leaf rust was found in early June in research plots at Ingham County. Disease pressure was at 40% incidence and 50% severity at the Michigan State University Mason Research Farm.

Illinois – Wheat leaf rust in a field at Neoga, Cumberland County, was about 50% severity and 30% incidence in mid-June. In contrast, the disease was only at a trace level in Champaign County. The Cereal Disease Laboratory received samples from both locations. The wheat crop was at the late dough growth stage.

Ohio – Two collections of wheat leaf rust were received at the Cereal Disease Laboratory from Tiffin (Seneca County) and Wooster (Wayne County) on June 21. Disease severity and incidence were about 50% at Tiffin and 25-30% at Wooster.

New York – Heavy leaf rust was found on Triticale in Willsboro, Essex County. A wheat leaf rust sample was received at the Cereal Disease Laboratory from Jefferson County.

Maryland – Two collections of wheat leaf rust were received at the Cereal Disease Laboratory from Queenstown (Queen Anne’s County) and Ellicott (Howard County). The disease severity was high at Queenstown, but the wheat crop was at the ripening growth stage.

Virginia – The Cereal Disease Laboratory received two collections of wheat leaf rust from Accomack and Nottoway counties in May. The wheat crop was at the mealy ripe growth stage during sampling.

North Carolina – Leaf rust was observed in Washington, Wake, and Lenoir counties and across the Coastal Plain and Tidewater but occurred late in the season.

Georgia – Wheat leaf rust was first observed in Miller County on April 19. There was no additional report from the state.

Alabama – In May, the Cereal Disease Laboratory received thirteen collections of wheat leaf rust from nurseries in Brewton (Escambia County) and Tallahassee (Elmore County). Disease severity ranged from low to moderate at the sampling time.

Louisiana – Wheat leaf rust was seen in south LA but developed very late in the season.

California – The Cereal Disease Laboratory received a leaf rust sample from triticale in a nursery at Davis, Yolo County.

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. Stripe rust was widespread in Georgia and severe on susceptible and resistant varieties. Growers in the state will need wheat varieties with a high level of resistance to stripe rust. The disease severity was high in the Pacific Northwest but limited in the central and northern Great Plains. Wheat stripe rust was reported in twelve states in 2022: Texas, Oklahoma, Kansas, South Dakota, Washington, Oregon, California, Michigan, North Carolina, Georgia, Mississippi, and Louisiana.

Texas – In early March at the Uvalde nursery, wheat stripe rust pressure on variety Jagalene ranged from 50 – 60% severity. Infection on soft-red winter Patton ranged from trace to 20S throughout the canopy levels. During the last week of March, stripe rust had spread uniformly across the nursery, and severity ratings were up to 80S and 50S in the lower and upper canopies, respectively.

Oklahoma – A trace level of wheat stripe rust was reported in the first week of March in Jackson County, southwestern OK. Due to persistent dry weather in April, only a few pustules of *Puccinia striiformis* were found at the Stillwater Agronomy Research Station, Payne County (north-central OK). After the early May rain, stripe rust at 40 – 70% severity was observed on susceptible variety Pete in the spreader row and on a breeding line. The temperature was above average in mid-May and suppressed the fungus sporulation. The rust telial stage appeared by the third week of May.

Kansas – Only trace levels of stripe rust in the mid to upper canopy were observed in the state in 2022.

South Dakota – Wheat stripe rust was first observed in Brookings on June 15. There was no additional report from the state.

Washington – Wheat stripe rust was high as usual in the winter nurseries at Mount Vernon, western Washington. The disease was up to 60% severity on susceptible varieties on April 13. In contrast, the rust appeared later than usual at research locations in eastern WA. Stripe rust was not found on wheat plants during the March and April field scout but was observed on wild grasses in the nurseries at Garfield County. During the May winter wheat fields survey in different counties in eastern Washington, stripe rust was observed in two commercial fields in Walla Walla County. Disease incidence was low, but rust pustules were very active. Stripe rust was at low severity in research fields in Garfield, Whitman, and Walla Walla counties. By mid-June, natural stripe rust had developed and spread quickly in the eastern part of the state as favorable weather conditions persisted in the area. Stripe rust was at the highest severity on susceptible winter wheat varieties and increased significantly on spring wheat in nurseries in Walla Walla and Adams counties. Wheat stripe rust was up to 80% severity on flag leaves in the experimental fields at Pullman, Whitman County. The disease was common in the commercial farms with winter wheat UI Magic, Curiosity, and Stingray in Adams, Benton, Franklin, Walla Walla, and Whitman counties. *Puccinia striiformis* was also found on goatgrass and a few other types of grass. There was no stripe rust in breeding nurseries and commercial fields during the June wheat fields scout of the Palouse region. However, in the artificially inoculated trials, the disease was severe on lower leaves and moderate on the upper canopy of winter wheat.

Oregon – Wheat fields in Umatilla County were scouted on April 15, but stripe rust was only found on wild grass in the rust monitoring nursery at the Hermiston Station. By mid-June, the disease had developed and was severe on wheat plants in the nursery. Wheat stripe rust was reported in Gilliam and Morrow counties.

California – Stripe rust was found on triticale.

Michigan – Stripe rust was first reported in Mason, Ingham County, on June 10. Disease incidence and severity were very low. There was no additional report from the state.

North Carolina – Scattered low incidence of stripe rust was reported from Washington County.

Georgia – There was a wheat stripe rust outbreak in Georgia. According to Dr. Alfredo Martinez, the 2022 growing season was challenging for wheat growers in many counties, especially those in the southwest and center of the state. The disease was not only severe in susceptible varieties but was found on AGS 2024, which contains the *Yr17* gene considered to be resistant to *P. striiformis*. Spring weather conditions in the state were prime for stripe rust development. Most of the growers sprayed fungicides to control the disease.

Mississippi – In March, a wheat stripe rust hot spot was observed on variety OVT in Stoneville, Washington County. There was no additional update from the state.

Louisiana – Wheat stripe rust was first noticed in a grower's field near Alexandria, central Louisiana, on January 19. At that time, the wheat crop had not reached the joint stage. In March, the rust was found in more growers' fields in the state. Stripe rust was widespread and severe in some research plots in Winnsboro, north LA, but disease pressure was lower in Baton Rouge, south LA.

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

Oat stem rust. Phenotyping of oat stem rust samples from Florida, Louisiana, and South Dakota has identified the pathogen as race TGN, the dominant race in the last two years in the United States.

Louisiana – Oat stem rust appeared unusually early. The rust is typically seen in spring in LA, and the earliest appearance in recent years was January 25, 2020. In the just completed growing season, oat stem rust was observed on December 15, 2021, in winter oat Secretariat LA495 plots at Baton Rouge in south Louisiana. Such early

detection indicates a natural overwinter of stem rust. Severity was low, but rust was found scattered on multiple plots. Baton Rouge experienced warmer fall 2021 weather and heavy dew, conditions that favor stem rust infection and development. The rust spread rapidly, and by mid-April, the disease pressure had increased significantly on susceptible genotypes.

Florida – A trace amount of oat stem rust was found in the oat nursery at Citra, Marion County.

South Dakota – About 30% severity and 20% incidence of stem rust was observed on susceptible varieties in the state spring oat nurseries in Brookings County.

Oat stem rust races identified to date from the 2022 collections.

Race	State	Host	Cultivar
TGN	FL	Winter oat	Breeding line
TGN	FL	Winter oat	Breeding line
TGN	LA	Oat	LA15039SB-38
TGN	LA	Oat	LA170175BS
TGN	LA	Winter oat	NC2-4700
TGN	LA	Winter oat	LA99016
TGN	LA	Winter oat	TX16OCS7048
TGN	LA	Winter oat	LA14105SBSB
TGN	SD	Spring oat	

Oat crown rust.

Texas – Low level of oat crown rust was found at the Castroville nursery on April 6. Oat stem rust was reported in the state.

Louisiana – Oat crown rust developed quickly in Baton Rouge and was severe on susceptible varieties. By the third week of April, the susceptible checks Brooks, Otana, Marvellous, and Ajay were rated 70S in the oat crown rust nursery. The crown rust population on the field appears to be the typical one based on the genotypes with known genes.

Alabama – Crown rust ranged from 20 – 80% incidence and 1 – 20% severity in fields in Escambia and Elmore counties.

Georgia – Oat crown rust was reported from south and central Georgia.

Florida – Oat crown rust pressure was higher in the oat nursery at Citra, FL, compared to a similar nursery at Baton Rouge, LA. During the third week of April, disease severity on susceptible checks had reached 90S. The oat crop was at the heading growth stage.

New York – Moderate to severe oat crown rust was reported from the Mohawk River Valley counties in central to eastern New York. Greater than 80% incidence and 1 – 20 % severity of crown rust were found on susceptible (Corral)

and resistant (Steuben, Hayden) spring oat in the nurseries at Ithaca, Tompkins County. Hayden was known to be resistant to *Puccinia coronata* before 2022. Dr. Gary Bergstrom, Cornell University, speculated the arrival of new virulence in the crown rust population. Resistant breeding lines SD150015, BC02004, and BC02005 had a few crown rust pustules, and samples from the varieties were sent to the Cereal Disease Laboratory. Wild oat on the roadside in Otsego County was severely infected with crown rust. The disease incidence ranged from 20 – 80%, but the severity was greater than 80%. Aecia were prevalent on buckthorn throughout the state in May and probably influenced the crown rust severity.

Minnesota – Trace levels of oat crown rust were found on the susceptible cultivar Marvelous in southern and southwestern Minnesota on July 20.

North Dakota – Low level of oat crown rust was found at Fargo in late July.

South Dakota – In mid-July, moderate severity and incidence of crown rust were observed in the state spring oat nurseries at Volga in Brookings County.

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

Barley leaf rust.

Virginia – Barley leaf rust was observed in Accomack County in May.

South Dakota – Light infection of *Puccinia hordei* was observed in a commercial barley field in Lincoln County and on Legacy and Celebration varieties in a small grain nursery in Brookings County.

Barley stripe rust. On April 14, stripe rust was at 40% severity on susceptible varieties in the winter nurseries at Mount Vernon, Washington. The disease was relatively uniform and severe compared to observation at the same time last year. Barley stripe rust was observed in California.

Rye stem rust. Rye stem rust incidence ranged from 1 – 20% at the small grain nurseries in Tompkins County, New York. The disease severity varied in the plots of KWS Progas, KWS Tayo, and Danko cultivars. Rust samples were received at the Cereal Disease Laboratory.

Rye leaf rust.

Texas – In April, the Cereal Disease Laboratory received a collection of rye leaf rust from a nursery at McGregor, McLennan County.

New York – In early July, moderate to severe leaf rust was observed on rye in research plots near Lake Champlain in the northern part of the state.

California – The Cereal Disease Laboratory received a rye leaf rust sample from a nursery at Davis in Yolo County.

Alternate host. Crown rust infections were observed on buckthorns (*Rhamnus cathartica*) in multiple counties in southeastern Minnesota. Low aecial infection of common barberry (*Berberis vulgaris*) was found in Winona County, southeast MN.

Thank you!

This is the final Cereal Rust Bulletin for 2022. We, members of the CDL, 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,
Oluseyi Fajolu, Ph.D.
Biologist
USDA-ARS Cereal Disease Laboratory.

Collaborator	State	Collaborator	State
Amanda Scherer	AL	Andrew Friskop	ND
Kathy Burch	AL	Mike McMullen	ND
Joshua Hegarty	CA	Julie Stevens	NE
Ali Babar	FL	Gary Bergstrom	NY
Alfredo Martinez-Espinoza	GA	Mike Hunter	NY
Ben Lopez	GA	Ken Wise	NY
Erick De Wolf	KS	Miller, J.	NY
Kelsey Andersen Onofre	KS	Meriem Aoun	OK
Steve Harrison	LA	John Fenderson	OK, KS
Tyler Gordon	LA, FL	Gazala Ameen	SD
Nidhi Rawat	MD	Dale Anderson	SD
Amanda Noble	MI	Shaukat Ali	SD
Eric Olson	MI, OH, IL	Sunish Kumar Sehgal	SD
Yue Jin	MN	Riley Dunne	SD
Jim Kolmer	MN, ND	Amir Ibrahim	TX
Roger Caspers	MN, ND, SD	Bryan Simoneaux	TX
Christina Cowger	NC	Nicholas Santantonio	VA
Upinder Gill	ND	Xianming Chen	WA, ID, OR

*The sole purpose of the Cereal Rust Survey listserv list is to provide a format for cereal researchers and extension personnel to share observations of cereal rusts and other cereal diseases. We make no warranty about any information shared on this listserv or its utility or applicability. Mention of any product, brand, or trademark does not imply endorsement or recommendation of that product, brand, or trademark by USDA-ARS, or any of the participants on this listserv. By enrolling on this listserv list, participants understand and agree to abide by these conditions.