



CEREAL RUST BULLETIN

Issued by:

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- Severe wheat stem rust isolates were reported from two out of seven states where the disease occurred in 2020.
- Wheat leaf rust was observed in twelve states across the U.S. but severe on only a few susceptible varieties.
- Wheat stripe rust was widespread in the Pacific Northwest and parts of the Plains.
- Oat crown rust and oat stem rust were widespread and severe in Louisiana.
- Barley stem rust was reported only from Nebraska in 2020.
- Barley leaf rust was found in Texas, Virginia, Washington, Minnesota, and New York.
- High barley stripe rust pressure was reported in the Pacific Northwest.
- *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 from seven states across the U.S. in 2020 and generally at low incidence and severity except for Louisiana and South Dakota with isolated severe stem rust. The disease was first observed in the Southeast on March 1. Stem rust level beyond what was ever seen was recorded in central Louisiana. In the Plains, stem rust occurred in Texas, South Dakota, and was seen in Oklahoma after about a decade. Across the Pacific Northwest and the Midwest, stem rust was reported from Washington and Minnesota. All wheat stem rust collections processed to date were identified as Pgt race QFCSC, the dominant race in the United States.

Louisiana – Early stem rust infection was observed in headrows at the Baton Rouge (East Baton Rouge County) nursery on March 1. By the end of March, disease pressure had increased significantly, and stem rust had begun to spread to adjacent areas of the field. In early May, a few lines in a state wheat trial in Alexandria (Rapids County) were severely infected with stem rust beyond the level of stem rust ever seen in that area. Genotyping and phenotyping of samples identified race QFCSC as the causal agent.

Virginia – On June 16, an isolated stem rust infection site was observed on a soft wheat breeding line in a nursery at Warsaw in Richmond County. Race QFCSC was identified from the stem rust sample collected from the nursery.



Texas – Six collections of wheat stem rust were received at the Cereal Disease Laboratory from Medina and McLennan counties in Texas. Race QFCSC was identified from the samples.

Oklahoma – A wheat stem rust hotspot was found in a nursery around Stillwater in north central OK on May 7. The stem rust sample from this location was determined to be race QFCSC. Stem rust observation is rare in Oklahoma and was seen last about a decade ago.

South Dakota – Severe stem rust was found on one awnless wheat line in a breeding nursery near Watertown in Codington County. Disease severity was similar in all the four replications, but only low infection of stem rust was seen on a few other lines after a close examination. Similarly, low levels of stem rust were found on a few awnless genotypes at the breeding nursery in Volga (Brookings County). In mid-August, heavy stem rust was observed on a susceptible variety in a late-planted spring wheat screening nursery in Brookings County. Wheat stem rust collections from these locations are in the race identification process.

Washington – Light infection of wheat stem rust was observed on a few winter wheat varieties in breeding nurseries near Pullman on June 29, and in one commercial winter wheat field near Palouse on July 16. Stem rust was reported only from these locations in Whitman County in the state.

Minnesota – Wheat stem rust was found on susceptible cultivar ‘Morocco’ in Crookston, Polk County.

Stem rust races identified to date from 2020 collections.

Race	State	Host	Cultivar	Disease
QFCSC	LA	SRW Wheat	Progeny Pgx18-9	Wheat stem rust
QFCSC	LA	Unknown Wheat	Unknown	Wheat stem rust
QFCSC	LA	Unknown Wheat	Unknown	Wheat stem rust
QFCSC	LA	SRW Wheat	Dyno Gro 9701	Wheat stem rust
QFCSC	LA	SRW Wheat	Progeny Pgx19-15	Wheat stem rust
QFCSC	NE	Triticale	Unknown	Wheat stem rust
QFCSC	NE	Barley	Unknown	Barley stem rust
QFCSC	OK	Unknown Wheat	STW-DPON 62-115	Wheat stem rust
QFCSC	TX	Winter Wheat	TX20M4060	Wheat stem rust
QFCSC	TX	Winter Wheat	Soft wheat population	Wheat stem rust
QFCSC	TX	Winter Wheat	Soft wheat population	Wheat stem rust
QFCSC	TX	Winter Wheat	Soft wheat population	Wheat stem rust
QFCSC	TX	Winter Wheat	Soft wheat population	Wheat stem rust
QFCSC	VA	SRW Wheat	15VDH-SRW02-075	Wheat stem rust
TGN	TX	Oat	Rodney	Oat stem rust
SDD	TX	Oat	Marvelous	Oat stem rust
TGN	TX	Oat	Nora	Oat stem rust
TGN	TX	Oat	TAMO 606	Oat stem rust
TGN	TX	Oat	TAMO 411	Oat stem rust
TGN	TX	Oat	TX140CS5061	Oat stem rust

Wheat leaf rust. Wheat leaf rust was present at low severity and incidence in 2020 in the Great Plains region and southern and eastern states. The disease was either severe on a few susceptible varieties or progressed when plants were maturing. Leaf rust was first reported from Texas and moved to the upper canopy in March. The rust spread across the Great Plains and was observed on wheat in Oklahoma and Kansas in April, and in Nebraska, South Dakota, and North Dakota in June. Wheat leaf rust observations in the Southeast were made in Louisiana, Kentucky, and from samples received from Virginia. Across the Pacific Northwest and the Midwest, leaf rust was reported from Washington, Wisconsin, and Minnesota.

Texas – Wheat leaf rust was found active and moving up the canopy of susceptible varieties of winter wheat in Castroville on March 17. Virulence to *Lr24* varieties was more compared to cultivars with *Lr39/41*. By April 7, the disease had spread uniformly across both spring and winter wheat nurseries. Leaf rust in the upper canopy of susceptible winter wheat TAM 110 was rated 70S, and susceptible spring wheat lines were rated 90S.

Oklahoma – Leaf rust was only observed on triticale in south central Oklahoma in mid-March. By late April, low levels of wheat leaf rust were reported from south central and southwestern areas. Wheat leaf rust became prevalent across the state in early May. During wheat disease survey in the northern and north central OK on May 19, moderate to severe leaf rust was found in a variety trial near Lamont, but plants were maturing.

Kansas – Only a few leaf rust pustules were observed on the lower leaves of susceptible checks in Hutchinson in April. Later in the season, moderate levels of leaf rust occurred on some varieties in the wheat variety nurseries. Wheat leaf rust collections from twelve counties in KS were received at the Cereal Disease Laboratory.

Nebraska – Wheat leaf rust was reported from the University of Nebraska Lincoln's farm in Lancaster County on June 8. Growers' fields scouted in the south central and southeast areas were without leaf rust. Wheat growth stages ranged from full heading in the northwest to dough development in the southeast at that time.

South Dakota – Wheat leaf rust on winter wheat in Brookings was at low severity in the third week of June. Disease severity and the incidence increased gradually and were at moderate levels by early August. Severe leaf rust was found in Codington County on August 6 on one susceptible variety.

North Dakota – Only a few pustules of wheat leaf rust were present on susceptible varieties in the winter wheat and spring wheat trials surveyed on June 24. Disease incidence was very low. Further disease progression was not reported.

Louisiana – Wheat leaf rust was reported from Winnsboro and Baton Rouge.

Kentucky – On May 22, wheat fields in Fulton and Graves Counties were scouted, but only a few soft red winter wheat fields had low levels of leaf rust. The majority of fields surveyed were without leaf rust. In May and June, wheat leaf rust collections from Woodford, Fulton, and Graves Counties were received at the Cereal Disease Laboratory.

Virginia – Twelve collections of wheat leaf rust were received at the Cereal Disease Laboratory from four counties in Virginia. Disease severity ranged from moderate to high.

Washington – Leaf rust was found on a single winter wheat cultivar in an experimental field near Pullman in late June. Wheat samples, from Skagit County, with low to moderate leaf rust were submitted to the Cereal Disease Laboratory in mid-July.

Wisconsin – Leaf rust infection occurred late in the season at all experimental trial locations of soft red winter wheat with, no significant impact on yield.

Minnesota – Leaf rust was observed at low incidence and severity in plots of winter and spring wheat in southern Minnesota in the last week of June. In mid-July, leaf rust was moderate on some spring wheat cultivars in Waseca (southern MN) but high at Crookston (northern MN). At both locations, leaf rust was severe on ‘Morocco’. Wheat leaf rust infection was low in wheat nurseries at Morris and Lamberton, and susceptible cultivars ‘Morocco’ and ‘Marquis’ had little leaf rust.

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. Wheat stripe rust was widespread across Oklahoma and Kansas and severe on susceptible cultivars as well as varieties previously considered resistant to *Puccinia striiformis*. Low to moderate disease levels were observed in other states in the Plains. Stripe rust was very severe on susceptible winter and spring varieties in the Pacific Northwest. Growers will need wheat varieties with a high level of resistance to stripe rust in the next growing season. In the Southeast, stripe rust did not develop to a great extent, and only one winter wheat field in Kentucky had high stripe rust pressure. Low levels of stripe rust were observed in the Midwest and Mid-Atlantic states. Wheat stripe rust was reported from seventeen states across the country in 2020: Texas, Oklahoma, Kansas, Nebraska, South Dakota, Washington, Oregon, Idaho, Montana, California, Louisiana, Kentucky, Virginia, Illinois, Wisconsin, Minnesota, and New York.

Texas – Wheat stripe rust was detected in Texas on March 3 in nurseries at Castroville and Uvalde. Symptoms, on susceptible soft red winter wheat Patton and hard red winter wheat TAM 110, were more severe and uniformly distributed at Uvalde compared to those at Castroville. The night temperature of 48 – 62 F at Uvalde favored the spread of stripe rust at that time. By March 17, stripe rust was no longer active at Castroville due to increasing temperature.

Oklahoma – Low levels of wheat stripe rust were observed on March 6 in variety demonstration plots around Stillwater in north central OK and on March 12 in south central OK. In early April, incidence and severity of stripe rust had increased and small to large hotspots were found around Stillwater, at Chickasha (central), and in southwestern OK. A plot with susceptible wheat variety was severely infected with flag leaves fully covered with stripe rust. The wheat crop was at the boot growth stage at that time. In late April to early May, the telial stage of the rust was found in the central and southern parts of the state due to warmer temperatures that make stripe rust less active.

Kansas – By May 2 wheat stripe rust was reported from different fields in seven counties: Sedgwick, Reno, Pratt, Ford, Saline, Dickinson, and Geary. Infection was restricted to low and middle canopies at a very low incidence. By May 29 stripe rust had moved to the upper canopy in thirty-one out of the forty-eight counties where the disease was present. These include commercial and experimental fields. Although stripe rust was widespread across the state, disease incidence and severity were low in many locations. The disease was mostly found on susceptible varieties, but SY Monument, LCS Chrome, Larry, and Zenda varieties that were considered resistant to *P. striiformis* in previous seasons were also infected.

Nebraska – Stripe rust was first observed at trace incidence and severity in Thayer County in southeast NE on May 27. Wheat fields in the south central and southeast ranged from boot to flowering growth stages at that time. A follow-up wheat field scout in mid-June indicated no disease development due to hot and dry weather. Stripe rust was not reported from elsewhere in the state.

South Dakota – In early June, low levels of stripe rust were observed in winter wheat variety trials at Hughes and Tripp Counties. By June 18, heavy stripe rust was found on winter wheat cultivar 'Expedition' in a trial plot at Winner, Tripp County. At that time, the majority of winter wheat was past flowering, and an increase in foliar disease is not likely to significantly impact yield. Moderate stripe rust was reported on susceptible varieties in Brookings County.

Washington – Stripe rust observations from the winter wheat fields scouted in ten counties on February 26, April 1, and April 21 were below 1% incidence in a commercial field in Lincoln County and on susceptible check variety in an experimental field in Walla Walla County. Stripe rust was first reported from the Palouse region on May 5, and the rust was limited to the lower leaves of susceptible varieties in two winter wheat experimental fields around Pullman in Whitman County. Stripe rust severity, in the experimental field in Walla Walla, increased significantly from low levels in April to 100S in the first week of June. Heavy stripe rust was found on winter wheat cultivar 'UI Magi' that was rated moderately susceptible in 2019. Stripe rust was severe as usual in the winter wheat nurseries at Mount Vernon in Skagit County, and the disease reached 100% severity on susceptible varieties in May. By the end of June to early July, wheat stripe rust severity was rated 90 – 100S on susceptible varieties in all the experimental winter and spring wheat nurseries across the state. Commercial winter wheat fields were mostly free of stripe rust as the growers controlled the disease with fungicide applications. In the Palouse region, symptoms of stripe rust infection on winter and spring wheat were mostly necrotic stripes that resulted from either fungicide activities against the rust or resistant response. A few fields in the region had active pustules but at low incidence and severity. Stripe rust on both wheat and barley was under control in the Palouse region.

Oregon – Wheat stripe rust was observed on susceptible wheat variety in a disease monitoring nursery in Pendleton after surveying different fields in Umatilla County on February 26. In early June, stripe rust was 100S on susceptible varieties in the winter wheat nurseries at Hermiston. Winter wheat cultivar 'Bobtail', previously considered highly resistant to *P. striiformis*, was found with more rust than ever before in experimental fields at Corvallis in Benton County. Stripe rust was reported on cultivar 'UI Magic' at Adams in Umatilla County.

California – On April 20, severe stripe rust was observed on triticale varieties in the Central Valley, CA.

Louisiana – Wheat stripe rust was observed at low levels in nurseries at Winnsboro and Baton Rouge on February 28. Disease progression and spread were limited due to the higher average temperatures in March. Only a few susceptible varieties had approximately 20% severity in Winnsboro and 50% severity in Baton Rouge. By the end of March, stripe rust was no longer active at these locations. The disease was not reported elsewhere within the state.

Kentucky – A severe stripe rust pressure was observed in a soft red winter wheat field in Fulton County on May 22. Low levels of the rust were found in a few of all the fields surveyed in Fulton and Graves Counties. Stripe rust was first seen in a wheat trial in Caldwell County at low incidence and severity on May 11. Wheat was at the post-anthesis growth stage at that time.

Illinois – Scattered wheat stripe rust was observed in winter wheat fields in Crawford, Clark, and Madison Counties on May 6. In late May, several fields in thirteen scouted counties were found with low levels of stripe rust in the lower canopy. Wheat fields in the central area were approaching flowering at that time. Growers treated fields with a fungicide to control Fusarium Head Blight at flowering. Such products do have activity against stripe rust.

Wisconsin – In late May to early June, wheat stripe rust was found on susceptible cultivars in the uniform variety trials in Calumet and Columbia Counties. Disease incidence and severity were low, and no increase was noticed in fields surveyed across the state on June 23. The weather was too hot and dry for stripe rust to thrive.

Minnesota – On June 11, infection foci of stripe rust were observed in a winter wheat nursery planted in St. Paul, Ramsey County. Wheat in the nursery ranged from fully headed to anthesis. Disease severity at the infection foci ranged from trace to 20%. Infected leaves were on the upper canopy, indicating recent infection from an extraneous source of inoculum. The disease progressed slowly in the nursery on a few varieties susceptible to stripe rust.

New York – In the first week of June, wheat stripe rust was observed on soft red winter wheat cultivars ‘Erie’ and ‘Seedwa 550’ in Seneca and Wayne Counties, respectively. Later in June, stripe rust was confirmed in Cayuga and Tompkins Counties. Disease severity and incidence were low in all the counties. In general, cereal rust development and progression were limited across the state, and thereby not a big concern in the 2020 winter cereal production. The unusually warm and dry conditions most likely suppressed rust diseases.

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

Oat crown rust.

Louisiana – Oat crown and stem rust were first observed at low severity and incidence in oat plots at Baton Rouge in south Louisiana on January 25. Weather conditions were wet and warm, which favored the progression of the diseases. By mid-February, oat crown and stem rust had increased significantly and spread in nurseries in Baton Rouge and Alexandria (central Louisiana). At the end of March, oat crown rust was widespread and severe on susceptible varieties at both sites, with many dead plants before heading in Baton Rouge. At Winnsboro, northeast LA, oat crown rust was moderate to severe on susceptible check varieties Brooks.

South Dakota – Oat crown rust began to develop on oat fields in mid-June and increased significantly during the season.

Minnesota – Oat crown rust was severe on cultivar ‘Marvelous’ in the disease detection plots but at low levels on other oat plots at Waseca and Lamberton in Waseca and Redwood Counties, respectively. Crown rust was at low levels in all oat plots at Morris and Crookston in Stevens and Polk Counties, respectively.

New York – Severe oat crown rust was found in a field in Livingston County in June. Crown rust disease was reported from spring oat variety plots in Ulster and Steuben Counties in mid-July.

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

Oat stem rust.

Louisiana – Oat stem rust progressed rapidly after its first observation on January 25 and spread in nurseries in Winnsboro, Baton Rouge, and Alexandria. Stem rust was very severe on oat in Winnsboro compared to Baton Rouge and Alexandria. According to Steve Harrison, this year had the most severe oat stem rust he has seen in many years in Winnsboro. Stem rust devastated susceptible varieties and was the most challenging in oat production in recent years.

Texas – The Cereal disease laboratory received nine collections of oat stem rust from Hidalgo, Kleberg, Uvalde, and McLennan Counties in Texas. Races TGN and SDD were identified from the samples.

Barley stem rust. On July 14, Dr. Stephen Baenziger found stem rust on winter barley at the Eastern Nebraska Research and Extension Center near Mead in Saunder County. At this location, the majority of the late winter barley plants with green stem were infected. He observed stem rust on a few triticale plants in the segregating bulk at Havelock farm in Lincoln (Lancaster County). These were remarkable observations as natural stem rust infection of barley and triticale are not

common in the field. Also, underline the importance of late-season scouting, and that stem rust infection occurs on crops other than wheat. Rust samples collected from both barley and triticale were identified to be race QFCSC, the dominant race in the U.S. Severe stem rust infection on barley contributed to the abandonment of barley nursery in Mead. The common barley diseases in Nebraska are Barley Yellow Dwarf Virus and loose smut. Severe stem rust observed at Mead this year could be due to the winter injury of the barley crop. Barley stem rust was not reported from elsewhere in the United States this year.

Barley leaf rust.

Texas – Barley leaf rust was observed at the experimental plots in Weslaco in Hidalgo County in February. Fourteen barley leaf rust collections were received at the Cereal Disease Laboratory from Hidalgo County in Texas.

Virginia – Barley leaf rust was reported from Warsaw in Richmond County on May 22.

Washington – On June 30, minute leaf rust pustules were observed on a few leaves of a winter barley variety in a breeding nursery at Central Ferry in Garfield County. Further disease development was not reported.

Minnesota – A barley leaf rust sample from Stearns County was collected by USDA-ARS Cereal Disease Laboratory staff.

New York – In early June, low levels of barley leaf rust were found on multiple varieties in experimental plots at Cayuga and Tompkins Counties.

Barley stripe rust. Stripe rust was more severe on barley in the western than eastern Washington. In early June, stripe rust on susceptible varieties was rated 80S and 40S in winter barley nurseries at Mount Vernon and Walla Walla, respectively. A similar disease pattern was observed in the winter nurseries in July. In mid-July, stripe rust was up to 60-80% severity on susceptible spring barley varieties in all experimental fields across Washington. A low level of stripe rust was observed in one spring barley field in the Palouse region. Barley stripe rust was also reported from California and Oregon.

Alternate host. Moderate to severe aecial infections on common buckthorn (*Rhamnus cathartica*) were observed in southeastern Minnesota. Light aecial infections of common barberry (*Berberis vulgaris*) were found in southern Wisconsin. Crown rust aecia were present on buckthorn in central and western New York in May and June. A high infection of crown rust was seen on buckthorns on June 10 in South Dakota.

Thank you!

This is the final Cereal Rust Bulletin for 2020. We, members of the CDL, would like to thank our cooperators 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 cooperators' assistance, and we look forward to continued collaboration. The names of cooperators and corresponding states where observations and collections were made are listed below. We apologize if you are a submitter and by oversight, we did not include your name.

Sincerely,
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