



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
Katie.Liberatore@ars.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: Sam.Gale@ars.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 persisted in the Southeast (Louisiana, Arkansas).
- Wheat leaf rust was found in Minnesota and persists across the Southeast.
- Wheat stripe rust has now been reported in 24 US states and three Canadian provinces.
- Oat stem rust and oat crown rust contributed to significant damage in parts of Louisiana and Georgia.
- An unprecedented observation of barley leaf rust east of the Cascade Range was reported in the Pacific Northwest.
- Barley stripe rust was observed at low levels in Washington winter wheat nurseries.
- Pycnia and aecia were observed on common barberry in southern Minnesota and eastern and southern Wisconsin.
- *Request for cereal rust observations and samples in 2017.*

For original, detailed reports from our cooperators and CDL staff, please visit the [Cereal Rust Situation \(CRS\)](#) reports page on the [CDL website](#) or click the [CRS](#) link found throughout the bulletin.

Weather conditions. As reported in the [USDA Weekly Weather and Crop Bulletin](#), in mid May the upper Midwest Area experienced wet and cool conditions, which slowed fieldwork. The entire western half of the country experienced temperatures below average, while the lower Midwest Area and the rest of the eastern half of the country experienced higher than typical temperatures. Weather particularly slowed fieldwork in the Midwest, where suitable fieldwork days averaged less than three days. At the end of May and beginning of June, rain subsided and conditions cooled in the Midwest and Plains Areas as well as across the eastern seaboard. In contrast, higher than typical temperatures were experienced in the Pacific Northwest Area. As a consequence, suitable fieldwork days exceeded five days last week across the entire western half of the country. In contrast, fieldwork was slowed in portions of the Southeast (Louisiana, Mississippi, Arkansas) in most part due to pockets of heavy rainfall.

Crop conditions. According to the [USDA National Agricultural Statistics Service](#), on June 4, 49% percent of the winter wheat crop was reported in good to excellent condition nationwide compared to 62% last year at this time. Eighty-seven percent of the winter wheat had headed and 10% of the crop had been harvested. By June 4, 55% of the spring wheat crop was reported in good to excellent condition compared to 79% last year at this time. Sixty-two percent of the oat crop is reported in good to excellent condition, compared to 71% of the crop this time last year. Ninety-six percent of the oat crop had emerged and 35% had headed, which is comparable to the previous five-year averages. Sixty-nine percent of the barley crop is reported in good to excellent condition, falling 9% short of the previous five-year average. Ninety-nine percent of the barley crop was planted and 84% of the crop had emerged compared to averages of 96% and 87%, respectively, over the previous five-year period.



Wheat stem rust. Wheat stem rust observations have slowed since winter wheat matured and harvesting began across the southern Plains and Southeast Areas. However, poor-vernalization in the Southeast left viable wheat for survey in mid to late May at which time wheat stem rust remained active in experimental plots across Louisiana and Arkansas.

Plains Area. Stem rust has not been observed in the region since April (see CRB #2). In mid May, crops were reported at maturity across the southern plains and harvest was in progress. Across the Plains, stem rust has only been observed in Texas this year. An overwintering focus was observed in Castroville and race QFCSC was identified from the samples collected at this location. The only other observation in Texas was on susceptible ‘Morocco’ wheat in sentinel plots.

Southeast Area

Louisiana – In mid May during a survey trip throughout Louisiana, wheat stem rust was collected from agricultural research stations in Baton Rouge and Winnsboro. The disease was at low incidence, but moderate severity across all surveyed sites. Only a single earlier observation was reported from a research station in Crowley on April 17.

Georgia – Previously, wheat stem rust was found in Plains, Georgia towards the end of April in University of Georgia research fields. Severity was high in this area by harvest time in late May. Race QFCSC was identified from samples collected at this location. In addition to damage from rust infections, widespread vernalization issues and late frost damage affected wheat production throughout the state.

Arkansas – In mid May wheat stem rust was observed at trace levels (low incidence, low severity) at an agricultural research station in Mariana. Previously, stem rust was observed at low incidence (restricted to single variety), but at high severity in experimental breeding plots in Southeast Arkansas (Rohwer) in late April.

Mid-Atlantic Area. New reports have not been received from the Mid-Atlantic Area since the initial observation of wheat stem rust on wheat in Painter, Virginia in early May. Race QFCSC was identified from samples collected at this location.

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

Wheat leaf rust. The first observations of leaf rust in the Midwest Area was reported in early June (Minnesota). In the Southern Plains, the wheat crop is at or nearing full maturity in most locations and harvesting has progressed in some locations over the past few weeks. Leaf rust was still present in the Southeast Area in late May. Observations have subsided in the Mid-Atlantic Area.

Plains Area. Wheat leaf rust has been observed in Texas, Oklahoma, Kansas, and Nebraska this season. In late May, leaf rust was still active in the Oklahoma panhandle and the crop was reported as at or near maturity across the state. Otherwise, new reports have not been received for the Plains states since the previous bulletin (CRB #3).

Southeast Area

Louisiana – In mid May, a survey of the eastern part of the state found leaf rust ranging between 20-80% severity in agricultural stations from Baton Rouge to Winnsboro.

Mississippi – There have not been new reports of leaf rust in Mississippi since the initial early observation in January and subsequent development in the early spring.

Georgia – In general, leaf rust was infrequently observed in commercial fields throughout the state this year. Previously, leaf rust was observed in the western part of the state in early to mid April (Plains and Griffin).

Mid-Atlantic Area. There have not been new reports of leaf rust in the Mid-Atlantic Area since the previous bulletin. Previously, leaf rust was reported as widespread and severe in eastern Virginia (Painter) in early May.

Midwest Area

Minnesota - On June 1, trace to low levels of wheat leaf rust was observed on lower leaves of susceptible winter wheat cultivars in St. Paul test plots.

Canada

Ontario – On May 15, leaf rust remained at trace levels in southern Ontario. Previously, leaf rust was observed by a grower in winter wheat fields northwest of Toronto in late April (Bruce County; bordering Lake Huron) on variety WB425. It is suspected that this was an overwintering focus due to high snow coverage in this area as surrounding fields were not affected.

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](#)

2016 wheat leaf rust survey summary and results are now available.

Please visit: [Wheat leaf rust race survey results](#).

Wheat stripe rust. Wheat stripe rust remains widespread throughout the US and Canada. In early to mid May, the disease has persisted and spread through the northern Plains, Pacific Northwest, and Mid-Atlantic Areas. While reports from Canada have subsided in Alberta, the disease persists in Ontario and new observations have been made in Manitoba.

Pacific Northwest Area

Washington – On May 18, stripe rust was observed at high severity on susceptible varieties in east central (Lind; 90%) and southeastern (Walla Walla; 100%) nurseries. In southeastern Washington commercial fields, stripe rust was under control aside from a few foci in Garfield County. Weather conditions favor further development of stripe rust in this area. Previously, wheat stripe rust was observed throughout the state beginning in Walla Walla in mid March and spreading through east central (Skagit) and northwestern (Grant, Douglas, Lincoln, Whitman) counties through April and May.

Oregon – By May 18, stripe rust was under control in commercial fields near the Washington border. However, the weather remains conducive to further stripe rust development. Previously, wheat stripe rust was observed across the Willamette Valley in early May and in variety trials in northeastern Oregon throughout March and April in variety trials.

Idaho – By May 18, wheat stripe rust was mostly under control in commercial fields near the southeastern Washington border (Nez Perce and Latah counties). In late April, stripe rust was observed across western (Parma), south-central (Twin Falls) and southeastern (Power) counties.

Southeast Area. An isolated, very early, observation of wheat stripe rust was previously reported from a field in North Carolina. In addition, stripe rust was reportedly widespread across Louisiana, Mississippi, and Georgia. New observations have not been received for the former two states since the previous bulletin. However, new reports from Georgia suggest that though widespread, stripe rust was not a major problem in commercial fields this season. Far more damage resulted from poor-vernalization and late frost.

Mid-Atlantic Area

Delaware, Maryland, and Virginia – Additional reports of stripe rust in this area have not been received since the previous bulletin. In early May, wheat stripe rust was reported as severe in coastal Virginia following earlier observations across Virginia, southern Delaware, and Maryland throughout April.

New York – On May 26, stripe rust was observed in Yates County on soft red winter wheat variety Erie. Heavy rust concentrated in lower canopy foci around the field suggests that this was an overwintering site. Stripe rust was also observed in Genesee County winter wheat fields and additional reports indicate widespread infection, albeit at low levels, across western New York.

Plains Area. Wheat stripe rust has been widespread this year across the entire region. Previous observations from Texas, Oklahoma, Kansas, Tennessee, Nebraska, and Montana are detailed in the previous bulletins and the CRS database. Observations from Colorado and the Dakotas in the latter half of May and into June are presented below.

Colorado – Stripe rust was observed in fields in early to mid-May.

South Dakota – In mid-May, stripe rust was observed at low incidence and severity in southern and east central counties (Hand, Tripp, Brookings, and Union). On June 1, stripe rust was also observed in fields across nearby Codington and Clark counties. In some cases the infection was noted as severe. Weather conditions have remained conducive to continued rust development. Earlier in May, wheat stripe rust was found at low incidence and low severity in a single winter wheat field in Hand County, but was absent in neighboring Hyde, Hughes, Sully, Stanley and Lyman counties.

North Dakota – On May 31, stripe rust was found at low incidence in a northwestern North Dakota field planted with old bin run seed.

Midwest Area. Wheat stripe rust has been observed in Kentucky, Indiana, Wisconsin, and Minnesota. The highest severity has been reported in the latter two states and updates from the past three weeks are presented below. Previous observations from Kentucky and Indiana can be found in the previous bulletins and in the CRS database.

Wisconsin – On May 28, winter wheat was reported at or near heading across the state. Wheat stripe rust infection was nearing epidemic levels on susceptible winter wheat varieties with severe infection on L2 leaves and was increasing in severity on flag leaves (20%+). However, in some locations, fields planted with more resistant varieties have avoided infection entirely. Wheat stripe rust was first observed in south-central Wisconsin in March and was present in southeastern and central Wisconsin fields by late April (see CRB #2 and CRS).

Minnesota – On May 30, stripe rust was observed at high severity in Lamberton and was also detected in St. Paul NRPN winter wheat experimental plots. Rye leaf rust was also observed in both locations. On June 1, stripe rust was observed at low to moderate severity on flag leaves of hard red winter wheat varieties Jerry, WB Matlock, and AC Broadview in St. Paul test plots. Previously, trace levels of stripe rust was observed in mid May on St. Paul winter wheat experimental plots.

Canada. Wheat stripe rust has been observed at a single location in Alberta and at low incidence across several Ontario counties. Details regarding these observations may be found in previous bulletins and in the CRS database. In the past few weeks, wheat stripe rust was observed in Manitoba as presented below.

Ontario – Wheat stripe rust has spread and increased in severity across Southwestern Ontario, which is predicted to lead to significant yield loss.

Manitoba – Stripe rust was observed at low severity on winter wheat variety CDC Falcon in fields near Austin (135 km west of Winnipeg). This is believed to be due to an overwintering focus.

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

Please send wheat and barley stripe rust collections as soon as possible after collection to: Dr. Xianming Chen, USDA-ARS (Washington State University; see details in attached rust collection guide).

Cereal Disease Laboratory
www.ars.usda.gov/mwa/cdl



Oat stem rust. In a mid May survey extending from Baton Rouge, Louisiana north through Louisiana, Arkansas and into southern Missouri, oat stem rust was observed at several locations. Samples were collected in Louisiana (Baton Rouge, Winnsboro) and Arkansas (Marianna) from agricultural research sites. Disease severity was high at all locations. In addition, oat stem rust was recently observed in Plains, Georgia research fields. Previously, oat stem rust was also observed in southern Texas in March. It was also noted that oat stem rust contributed to significant crop damage in parts of Louisiana, including severe lodging in northern experimental fields. Two races, TGN and TJS, have been identified in some of the samples collected from Texas and Louisiana. These races are virulent on *Pga*.

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

Oat crown rust. Oat crown rust contributed to severe damage in parts of Louisiana and Georgia this spring. Scant observations have been received from elsewhere in the country. Previous reports from Texas (on winter wheat) and Minnesota (pyniospores on buckthorn) are detailed in the previous bulletins and in the CRS database. New reports from the southeast are presented below.

Southeast Area

Louisiana – Oat crown rust remained active in Baton Rouge and Winnsboro in mid May as reported during a survey across Louisiana, Arkansas, and Missouri. Disease severity was high (50-100%) at both locations. Oat crown rust developed and spread throughout the state early this year (beginning in February) and contributed to severe damage in northern experimental plots. Races TGN and TJS were identified from samples collected in Louisiana.

Mississippi – No new reports have been received since the release of CRB #2. Previously, oat crown rust was reportedly widespread throughout the state by mid April.

Georgia – Oat crown rust was observed at high incidence from early in the growing season. Oat crown rust reportedly contributed to severe damage and loss of crops in central Georgia.

Midwest Area

Minnesota – By June 7, spreader rows in the St. Paul buckthorn nursery were flecking, with spores starting to show.

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

Barley leaf rust. Reports of barley leaf rust have subsided in the Mid-Atlantic Area where it was active in mid April in southern Maryland and Delaware and by early May in eastern Virginia. However, new observations have been received from the Pacific Northwest Area.

Pacific Northwest Area

Washington – In mid May, barley leaf rust was found in a few fields in Walla Walla County at high incidence and moderate to high severity (40-100%) on the winter variety Maja. According to Dr. Xianming Chen, this is the first observation of barley leaf rust in the Pacific Northwest Area east of the Cascade Range.

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

Barley stripe rust. By mid May, barley stripe rust was observed in Washington winter wheat nurseries at low levels in several locations (Mount Vernon, Lind, and Walla Walla). Weather conditions are conducive for further development.

Barley stem rust. Barley stem rust has not been reported this season.

Rust on barberry. Rust infections (pycnial and aecial stages) on common barberry (*Berberis vulgaris*) have been observed in southern Minnesota as well as eastern and southern Wisconsin. Past studies indicated that these infections were of *Puccinia graminis* f. sp. *secalis*, the form that infects rye and Triticeae grasses. Moderate to heavy aecial infections were observed on *Berberis* x 'Tara' Emerald Carousel (an ornamental barberry hybrid) in several locations in the Twin Cities metro area. The rust on this barberry hybrid is likely of *Puccinia pseudostriformis* (formerly *P. striiformis* f. sp. *poae*) that causes stripe rust on Kentucky bluegrass (*Poa pratensis*).

Identifying rust diseases of wheat and barley

A guide developed by the multi-state extension and research committees for small grain diseases, NCERA-184 & WERA-97, is available at: http://www.ars.usda.gov/SP2UserFiles/ad_hoc/36400500Publications/Rust_Diseases_National.pdf

Current cereal rust situation

For the latest cereal rust situation reports, please subscribe to the cereal rust survey listserv list*.

Instructions can be found at:

<http://www.lsoft.com/scripts/wl.exe?SL1=CEREAL-RUST-SURVEY&H=LISTS.UMN.EDU>

Or, if you prefer, simply send a subscription request to Sam Gale (Sam.Gale@ars.usda.gov).

All messages sent to the list are archived on the CDL website: <http://www.ars.usda.gov/Main/docs.htm?docid=9757>

*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.

Request for cereal rust observations and samples

Cereal Disease Laboratory, USDA-ARS, St. Paul, MN

(Please save this for future reference)

Cooperators' assistance is critical to our work

We depend on the assistance of our cooperators for cereal rust observations and samples (as well as other significant small grain disease observations). Without this assistance our job would be much more difficult. We sincerely thank all those who have assisted us in the past and hope the assistance continues this year and in future years.

Observations

If you have information on the cereal rust situation in your area that you would be willing to share with the group, please email your observations to:

CEREAL-RUST-SURVEY@LISTS.UMN.EDU *

Or, to: Katie Liberatore (Katie.Liberatore@ars.usda.gov)

We would like to include your name and email address so others can contact you. If, however, you prefer not having your name or email address appear with the information, please let us know when submitting your observations.

Cereal Disease Laboratory
www.ars.usda.gov/mwa/cdl



Information of most importance

We welcome any information you can provide, but are particularly interested in:

- ∞ Location (state, county, city)
- ∞ Rust (leaf rust, stem rust, stripe rust, crown rust)
- ∞ Host (wheat, barley, oat, grasses, etc.)
- ∞ Cultivar or line name if known
- ∞ Grain class if known
- ∞ Severity and prevalence
- ∞ Growth stage: when the rust likely arrived, when infection was first noted and current growth stage
- ∞ Where rust is found on the plants, e.g., lower leaves, flag leaf, etc.

Guidelines for making cereal rust uredinial collections**

Reports on the distribution of races of cereal rust fungi are an important part of our annual cereal rust surveys. We routinely collect and test isolates of stem rust (wheat, oat, and barley), wheat leaf rust, oat crown rust and barley leaf rust. We are most interested in small grain collections (wheat, barley, oat and rye), but are also interested in stem rust, leaf rust, and stripe rust collections from grasses, e.g.:

Jointed goatgrass (*Aegilops cylindrica*) Ryegrasses

(*Elymus* spp.) Wheatgrasses (*Elytrigia* spp.)

Wild barleys (*Hordeum* spp.) Wild oat (*Avena fatua*)

Common grasses, e.g., *Agropyron*, *Agrostis*, *Festuca*, *Leymus*, *Lolium*, *Phleum*, and *Psathyrostachys* spp.

Images and descriptions of the above grass species can be found on the USDA Natural Resources Conservation Service's [PLANTS Database](#) website

1. Rust pustules should be fresh and fully developed, except when this may not be possible, i.e., the first uredinial collections found early in the season.
2. When rusted small grain or grass plants are encountered, please cut 5 to 10 sections of plant stem (if possible, avoid including plant nodes as they do not readily air dry) or leaf, 4 inches long with large and small pustules and place in a regular paper mail envelope (**Please Do Not use plastic or waterproof envelopes**). Do not staple or tape the envelope, instead fold the flap shut.
3. Important information should be recorded for each collection, e.g., date, county, state, cultivar or line, crop stage, whether collection is from a nursery or commercial field, etc. Please use our data collection form ([standard pdf](#) or [fillable pdf](#)) if possible. If the grass genus or species is unknown to the collector, please send a head in a separate bag or envelope if possible, indicating which collection it is associated with to aid in identification.
4. Please avoid exposing samples to direct sunlight or unusual heat of any kind, e.g. car dashboard, outside mailboxes, etc. Samples should be kept at room temperature for 24 hours to allow the plant material to dry. Afterwards the samples should be placed in a cooler or refrigerator before they are mailed. Please do not keep samples in a freezer. The samples should be sent to us as soon as possible after the samples have dried.
5. Please promptly mail the envelope(s) with the appropriate collection form inside each envelope to:

Cereal Disease Laboratory, USDA-ARS 1551 Lindig Street
University of Minnesota St. Paul,
Minnesota 55108

**** Stripe rust collections should be sent to:**

By FedEx or UPS:

Dr. Xianming Chen USDA-ARS
361 Johnson Hall Washington State University Pullman, WA 99164-6430

Cereal Disease Laboratory
(www.ars.usda.gov/mwa/cdl)



By regular mail: Dr. Xianming Chen 361 Johnson Hall
P.O. Box 646430 Washington State University Pullman, WA 99164-6430

Note: Stripe rust collections are vulnerable to heat and do not survive long at warm temperatures; therefore, if shipment of collections for race identification is delayed their viability will be greatly reduced. An overnight courier service is preferred for sending stripe rust collections.

If you have any questions regarding stripe rust samples, contact: Xianming Chen, Phone 509-335-8086; e-mail: xianming@wsu.edu or xianming.chen@ars.usda.gov

Thank you in advance for your assistance!