



# 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](mailto: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](mailto: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 was observed at low incidence and low to moderate severity in Illinois and Indiana.
- Wheat leaf rust was observed in the Ohio Valley (Illinois, Indiana, Ohio), upper Midwest Area (Minnesota) and the Great Plains Area (Nebraska, North Dakota, South Dakota).
- Wheat stripe rust has now been reported in 27 US states and three Canadian provinces.
- Oat stem rust and oat crown were found at low incidence and low to high severity across the Ohio Valley.
- Barley stripe rust was observed at unusually high incidence and severity in parts of Washington.
- *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 visit the [Cereal Rust Situation Reports and Cereal Rust Bulletins](#) home page.

**Weather conditions.** As reported in the [USDA Weekly Weather and Crop Bulletin](#), in mid to late June, the upper Midwest and upper Plains states experienced cooler than normal temperatures. While the upper Midwest received adequate rain and some isolated thunderstorms, the weather did not appreciably slow fieldwork compared to previous weeks. However, the rain bypassed the Dakotas and Montana causing drought conditions and concern for small grain development. The entire western half of the country experienced temperatures well above average, with record heat waves in California, Nevada, and Arizona. Temperatures exceeded the normal average by 20 degrees F in some locations. Suitable fieldwork days exceeded six days last week across the entire western half of the country. In contrast, fieldwork was affected in the Southeast (Louisiana, Mississippi, Alabama) due to heavy rain from the landfall of tropical storm Cindy. This wet front moved eastward and slowed fieldwork across the eastern half of the country, and notably, record rainfall was reported in the mid-Atlantic.

**Crop conditions.** According to the [USDA National Agricultural Statistics Service](#), by July 5, 48% percent of the winter wheat crop was reported in good to excellent condition nationwide compared to 62% last year at this time. Fifty-three percent of the winter wheat crop had been harvested. Thirty-seven percent of the spring wheat crop was reported in good to excellent condition compared to 72% last year at this time. Fifty-nine percent of the spring wheat has headed. Fifty-three percent of the oat crop is reported in good to excellent condition, compared to 67% of the crop this time last year. Eighty-five percent of the oat crop had headed, which is comparable to the previous five-year averages. Fifty-two percent of the barley crop is reported in good to excellent condition, falling 23% short of the previous five-year average. Fifty-one percent of the barley crop had headed, which falls 6% short of the previous five-year average.

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**Wheat stem rust.** New observations of wheat stem rust were made during a survey trip through the Ohio Valley (June 12-16). Otherwise, wheat stem rust observations have ceased in the Southeast since winter wheat matured and harvesting began across the southern Plains and Southeast Areas.

**Ohio Valley.** A survey by USDA-ARS Cereal Disease Laboratory staff was conducted between June 12-16 along a route from St. Louis, MO extending northeastward through Illinois, Indiana, and Ohio, and into southeastern Michigan. Stem rust was observed in Illinois and Indiana where the wheat was predominantly in the soft dough stage.

*Illinois* – Wheat stem rust was observed at low incidence and low to moderate severity in two research fields (Champaign).

*Indiana* – Wheat stem rust was observed at low incidence and low to moderate severity in a research field (Vincennes) and two private fields (Miami County; near Denver, IN and Roann, IN).

**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.** Stem rust was observed in Louisiana, Georgia, and Arkansas this year. Though vernalization issues slowed crop maturity, most of the winter wheat crop has been harvested in the region (e.g. ninety-eight percent harvested in Arkansas) and therefore, further reports are not anticipated. In a mid May survey trip, wheat stem rust was observed at low incidence, but moderate severity across plots in agricultural research stations in Baton Rouge and Winnsboro, Louisiana. Previously, wheat stem rust was found in April in Louisiana, Georgia, and Arkansas in research plots. Race QFCSC was identified from samples collected in Georgia.

**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.** New observations of wheat leaf rust were reported in the Ohio Valley (Illinois, Indiana, Ohio), Midwest (Minnesota), and Plains Areas (Nebraska, North Dakota, South Dakota). Previously, the first observations of leaf rust in the Midwest Area was reported in early June (Minnesota). Leaf rust was still present in the Southeast Area in late May, however, most of the winter wheat crop has now been harvested in this area.

**Ohio Valley.** Wheat leaf rust was the most prevalent disease observed in a mid-June survey trip (June 12-16) covering a route from St. Louis, MO through Illinois, Indiana, Ohio, and into southeastern Michigan. Leaf rust was found at low to moderate incidence and severity in eleven out of seventeen fields surveyed in this region. The highest incidence and severity was observed in research plots in Vincennes, IN (Knox County), Champaign, IL (Champaign County), and Wooster, OH (Wayne County).

**Midwest Area.** Wheat leaf rust was rarely spotted on a late June survey trip (June 27-29) through western Minnesota and throughout South Dakota (see Plains Area observations as well).

*Minnesota* – Wheat leaf rust was observed in Lamberton Minnesota nursery plots (southwestern Minnesota).

**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. New observations have only been reported from Nebraska and the Dakotas in June.

*Nebraska* – Wheat leaf rust has developed to severe levels across untreated fields in south central and eastern counties. Plants are reaching maturity in this area.

*North Dakota* – Wheat leaf rust was reported in research plots of spring wheat near Fargo.

*South Dakota* – On a late June survey trip (June 27-29) through southwestern Minnesota and east central South Dakota, wheat leaf rust was observed at low incidence in nursery plots at a few locations. Stripe rust remains the most prevalent rust in this area and leaf rust was harder to come by in most nurseries visited. However, a higher prevalence of leaf rust was observed in Volga nursery plots on winter wheat.

**Southeast Area.** Wheat leaf rust was reported in Louisiana, Mississippi, and Georgia this season. The earliest report was in January in Mississippi. By early April, it was observed in Georgia, though disease incidence was very low across the state this year. In May, leaf rust was found at moderate to high severity across experimental fields in eastern Louisiana.

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

**Midwest Area.** Leaf rust has been reported from west central Minnesota on spring wheat. Previously, trace to low levels of wheat leaf rust was observed on lower leaves of susceptible winter wheat cultivars in St. Paul, Minnesota test plots on June 1.

**Canada.** There have not been new reports of leaf rust since the previous bulletin where the disease remained at trace levels in southern Ontario. In late April, an overwintering focus was identified in winter wheat fields northwest of Toronto on variety WB425.

**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 continues to be the most prevalent cereal rust threat throughout the US and Canada. This year, wheat stripe rust has been reported in 27 states (Arizona, Arkansas, California, Colorado, Delaware, Georgia, Idaho, Indiana, Kansas, Kentucky, Louisiana, Michigan, Minnesota, Mississippi, Montana, Nebraska, North Carolina, North Dakota, New York, Oklahoma, Oregon, South Dakota, Tennessee, Texas, Virginia, Washington, and Wisconsin) and three Canadian provinces (Alberta, Manitoba, and Ontario). In early to mid June, new reports were received from the Plains Area (Nebraska, North Dakota, South Dakota), Midwest (Minnesota), and the Pacific Northwest (Washington).

**Pacific Northwest Area.** Wheat stripe rust was observed previously across Washington, Oregon, and Idaho. Winter wheat is nearing maturity and stripe rust is mostly under control in fungicide-treated fields and widespread use of resistant varieties. Stripe rust is now developing rapidly on susceptible spring wheat varieties in the area. New observations from Washington are detailed below.

*Washington* – On June 15, wheat stem rust was observed at 100% severity on susceptible checks in east central research fields on spring wheat that had passed the flowering stage. Cool and wet conditions favor further spreading of the disease. Previously, in mid May, 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. Earlier in the season, wheat stripe rust first developed in Walla Walla in mid March and spread through northwestern, central, and east central (Grant, Douglas, Lincoln, Whitman, Skagit) counties through April and May.

**Southeast Area.** Wheat stripe rust was observed across Louisiana, Mississippi, Georgia, and in an isolated case in North Carolina. Though widespread and persistent through May, stripe rust was not reported to be a major problem in commercial fields.

**Mid-Atlantic Area.** New reports have not been received since the previous bulletin. Wheat stripe rust was observed in Delaware, Maryland, and Virginia beginning in early April and persisting through early May. By late May, wheat stripe rust was observed in an overwintering focus in a single field in Yates County, New York. Additional reports indicated high incidence, but low severity infections across several counties in western New York.

**Plains Area.** Wheat stripe rust has been widespread this year across the entire region. Previous observations from Texas, Oklahoma, Kansas, Tennessee, Colorado, Nebraska, South Dakota and Montana are detailed in the previous bulletins and the CRS database. New observations from Nebraska and North Dakota from the past three weeks are detailed below.

*Nebraska* – In mid June, wheat stripe rust was observed at severe levels in south central and eastern Nebraska in untreated fields.

*North Dakota* – By mid June, stripe rust had been observed at low incidence in winter wheat including in western (Dunn County), northeastern (Langdon), southeast (Fargo), and central (Carrington) locations. Previously, on May 31, stripe rust was found at low incidence in a northwestern North Dakota field planted with old bin run seed.

*South Dakota* – On a survey trip (June 27-29) through east central South Dakota on a route through Volga, Miller, Selby, Aberdeen, Groton, Watertown, and Aurora, stripe rust was found in most locations aside from Aberdeen. In most cases, stripe rust was at high incidence.

**Midwest Area.** Wheat stripe rust has been observed in Kentucky, Indiana, Wisconsin, and Minnesota. It was most recently observed in a late-June survey trip in southwestern Minnesota (Lamberton) nursery plots. Wheat stripe rust first appeared in the Midwest in south-central Wisconsin in March and had spread to southeastern and central portions of the state by April. By late May, it was observed at epidemic levels in susceptible winter wheat varieties. Trace levels of stripe rust was observed in mid May in St. Paul winter wheat experimental plots and had progressed to low-moderate severity by early June. High severity was also observed in Lamberton. Additional details can be found in the previous bulletins and in the CRS database.

**Canada.** Wheat stripe rust has been observed across three Canadian provinces this year (Alberta, Manitoba, Ontario). A single, early report was received from an overwintering focus in Alberta. Low severity was observed in fields near Austin, Manitoba in late May/early June. Wheat stripe rust was persistent in fields across Southwestern Ontario. Increasing severity in late May is predicted to lead to significant yield loss.

**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).**

**Oat stem rust.** In a survey of the Ohio Valley in mid June (June 12-16), oat stem rust was found in two Illinois research fields (Champaign; low incidence, high severity) and in an Indiana grower's field (Tippecanoe County, south of Lafayette; low incidence, moderate severity). Previously, oat stem rust was observed in several locations during a mid May survey extending from Baton Rouge, Louisiana north through Louisiana, Arkansas and into southern Missouri. 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. In early spring, 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 virulent on *Pga*, TGN and TJS, have been identified in some of the samples collected from Texas and Louisiana.

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

**Oat crown rust.** In mid to late June, new observations of oat crown rust were reported in the Great Plains, Midwest, and Ohio Valley (survey trip, June 12-16). Reports have ceased from elsewhere in the country. Oat crown rust contributed to severe damage in parts of the Southeast as summarized below. Previous reports from Texas (on winter wheat) and Minnesota (pyniospores on buckthorn) are detailed in the previous bulletins and in the CRS database.

**Southeast Area.** Oat crown rust was observed previously this season in Louisiana, Mississippi, and Georgia. The disease developed early in the region and caused particularly severe damage in Louisiana and Georgia. Races TGN and TJS were identified from samples collected in Louisiana.

#### **Plains Area**

*South Dakota* – On June 26, oat crown rust was beginning to develop on differential lines in experimental plots in Brookings. Previously, on June 8, oat crown rust was first reported on select differential lines in Beresford. In addition, during a late June (June 27-29) survey trip through east central South Dakota, oat crown rust was observed in Volga.

#### **Midwest Area**

*Minnesota* – On June 27, oat crown rust was observed in the lower canopy of experimental plots in the St. Paul buckthorn nursery. In addition, on the way to South Dakota for a survey trip (June 27-29), oat crown rust was observed in southwestern Minnesota (Lamberton).

#### **Ohio Valley**

*Illinois* – In mid June, oat crown rust was observed at low to moderate incidence and severity in Illinois research plots (Champaign).

*Indiana* – In mid June, oat crown rust was observed at low to moderate incidence and severity in a grower's field in Tippecanoe County, south of Lafayette.

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

**Barley leaf rust.** New observations of barley leaf rust have not been reported since the previous bulletin. In mid May, an unprecedented observation of barley leaf rust in the Pacific Northwest Area east of the Cascade Range was reported at high incidence and moderate to high severity. In early spring, barley leaf rust was first observed in the Mid-Atlantic Area (Maryland, Delaware, Virginia).

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

**Barley stripe rust.** Barley stripe rust has been observed in California, Oregon, and Washington. It was first reported at low levels in mid May in Washington nurseries (Mount Vernon, Lind, and Walla Walla). Unusually wet weather led to uniform infection (severity up to 40%) of susceptible varieties in Lind by mid June. This is reportedly the most severe barley stripe rust epidemic in the past two decades.

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

**Rust on barberry.** Previously, in May, rust infections (pycnial and aecial stages) on common barberry (*Berberis vulgaris*) were observed in southern Minnesota as well as eastern and southern Wisconsin. Collections were made for race typing and analysis is in process. Previous 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](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](mailto: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](mailto:CEREAL-RUST-SURVEY@LISTS.UMN.EDU) \*

Or, to: Katie Liberatore ([Katie.Liberatore@ars.usda.gov](mailto: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.***

***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.

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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

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](mailto:xianming@wsu.edu) or [xianming.chen@ars.usda.gov](mailto:xianming.chen@ars.usda.gov)

**Thank you in advance for your assistance!**