



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 has been observed in coastal Virginia.
- Wheat leaf rust persists throughout the southern Great Plains and has been observed in the Mid-Atlantic and southern Ontario.
- Wheat stripe rust is widespread across the US and southern Ontario with notable persistence and spreading of the disease in the Great Plains (Oklahoma, Kansas, Nebraska) and in the Pacific Northwest (Oregon and Washington).
- Oat stem rust and oat crown rust contributed to significant damage in northern Louisiana in early May.
- Barley leaf rust persists in the Mid-Atlantic Area.
- *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 the first week of May, stormy and unusually cold conditions were experienced across much of the middle portion of the country, which slowed fieldwork and crop progress. Particularly notable events include flooding in the Gulf Coast and a late, crop-damaging snowstorm in western Kansas. In contrast, unusually warm temperatures were experienced in the Southwest and the Pacific Northwest Areas, with temperatures up to 10 degrees F above average in much of California. In the second week of May, easterly movement of warm weather as well as a break from stormy conditions in the northern Plains and upper Midwest was favorable for fieldwork and crop progress. Temperatures returned closer to typical averages in the Southeast, southern Plains, and Pacific Northwest Areas. Storms over the past month have alleviated drought stress in the Plains and Northeast Areas, though abnormally dry to extreme drought conditions persist in Alabama, Georgia, and Florida.

Crop conditions. According to the [USDA National Agricultural Statistics Service](#), on May 14, 51% percent of the winter wheat crop was reported in good to excellent condition nationwide compared to 62% last year at this time. Sixty-three percent of the winter wheat has headed, six percentage points ahead of the previous five-year average. By May 14, 78% of the spring wheat crop was planted, five percentage points ahead of the 5-year average, and 40% of the spring wheat had emerged, compared to an average of 44% of the crop over the previous 5-year period. Ninety-one percent of the oat crop was sowed and 72% had emerged, compared to an average of 87% and 71%, respectively, over the past five years. Sixty-two percent of the oat crop is reported in good to excellent condition, compared to 73% of the crop this time last year. Seventy-eight percent of the barley crop was planted, which is comparable to the 5-year average, and 42% of the crop had emerged compared to an average of 50% of the crop over the previous five-year period.



Wheat stem rust. In mid May, the first development of wheat stem rust in the Mid-Atlantic was reported (eastern Virginia). It was previously noted that stem rust was observed earlier than usual in the Southeast (Louisiana, Georgia, Arkansas). However, scant reports were made in southern Texas this spring and no stem rust development has been observed in the Great Plains region.

Plains Area

Texas – Harvest of winter wheat has begun in Texas and further stem rust has not been observed since the previous report. Previously, wheat stem rust was first observed in Castroville, TX on April 9 in a single, isolated plot with low disease incidence (20%), but high disease severity (up to 80%), which suggested this was an overwintering focus. Race QFCSC was identified from the samples collected from this location. By mid April, stem rust was observed in sentinel plots far from this site on susceptible ‘Morocco.’ Scouting was performed in Corpus Christi, TX in early April, at which time most wheat was already at full maturity, and no stem rust was present.

Southeast Area

Louisiana – Additional observations have not been reported since the first sighting at a research station in Crowley, Louisiana on April 17.

Georgia – Wheat stem rust was found in Plains, Georgia towards the end of April. It is rare to observe wheat stem rust in this area particularly this early in the season. Further development has not been reported.

Arkansas – Stem rust was observed in experimental breeding plots in Southeast Arkansas (Rohwer) in late April, remarkably earlier than observed in previous years. The disease severity was very high, but was specific to a single variety. Further development has not been reported.

Mid-Atlantic Area

Virginia - On May 10, wheat stem rust was reported in coastal Virginia (Painter).

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

Wheat leaf rust. In early to mid May, leaf rust continued to develop in the Plains Area (Oklahoma, Kansas, Nebraska). Though observations have subsided in the Southeast Area, new observations were reported in the Mid-Atlantic (coastal Virginia) and Canada (southern Ontario).

Plains Area

Texas – New reports of leaf rust have not been received since the previous bulletin. Previously, leaf rust was observed in research plots and growers’ fields throughout southeast Texas in February, which spread to central Texas by late March/early April and had progressed to high severity in some areas by the end of April.

Oklahoma – On May 5, leaf rust was severe on wheat in central Oklahoma (near Stillwater and further west) and covered greater than 60% of flag leaf area in unsprayed susceptible varieties. On May 15, wheat in the central region was reported at the soft to medium dough stages and flag leaves were mostly gone due to severe leaf rust infection (Kingfisher, El Reno). Further north, maturity lagged behind in the full kernel to milk stages and green flag leaves remained on resistant varieties (Lahoma, Alva, Cherokee). Previous reports in late March and early April indicated low incidence and severity of leaf rust throughout Oklahoma wheat fields and experimental plots (Oklahoma City, Stillwater, Enid, and Perkins), but became severe in some plots in Lahoma (northern Oklahoma, west of Enid) by late April. Significant flag leaf damage from leaf rust was reported in late April in southwestern (Altus) and central (Apache and Chickasha) Oklahoma.

Kansas – On May 6, leaf rust was reported at low levels in central Kansas, but was spreading in some cases to the upper canopy. In addition, several reports confirmed that the infection area spread into the west-central and northwestern counties by early May. Previously, leaf rust was first reported at low levels in fields in south-central and southeastern Kansas in early April and had spread to upper leaves in Rice and Cowley counties by late April.

Nebraska - In early May, a survey was performed covering 200 miles of southern fields near the Kansas border. Leaf rust was only found at trace levels in two south-central locations (Harlan and Webster counties).

Southeast Area

Louisiana – There have not been new reports of leaf rust in Louisiana since the original report in mid April.

Mississippi – There have not been new reports of leaf rust in Mississippi since the previous bulletin. Previously, leaf rust was spotted early (January) throughout the state and was the main threat to cereal crops in the region.

Georgia - Leaf rust was found in the western part of the state in early to mid April (Plains and Griffin; reported May 4).

Mid-Atlantic Area

Virginia - On May 10, wheat leaf rust was wide spread and severe in eastern Virginia (Painter).

Canada

Ontario - On May 5, leaf rust was observed at low levels across southern Ontario. On April 29 it was first found by a grower in winter wheat fields northwest of Toronto (Bruce County; bordering Lake Huron) on variety WB425. This was likely an overwintering focus as there was high snow cover in this area and thus far wheat leaf rust has not been detected in other fields planted with this same variety or on any other varieties in surrounding fields.

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 is widespread throughout the US and Canada. In early to mid May, the disease has persisted and spread through the Plains and Pacific Northwest Areas. Reports of stripe rust have subsided in the Midwest and Southeast Areas. However, development of stripe rust was first observed in the Mid-Atlantic (Virginia) this past week. Low incidence has been reported recently in Ontario, Canada and was previously reported in Alberta, Canada.

Pacific Northwest Area

Washington – In early May, wheat stripe rust was found on susceptible varieties (up to 40% severity) of winter wheat in northwestern Washington (Skagit County) where the crop was at Feekes 5 to 7 (late tillering to jointing). Stripe rust was found at high incidence with very low to high severity across fields in central and east central Washington (Grant, Douglas, Lincoln, and Whitman counties) where the crop was at Feekes 4 to 8 (early tillering to jointing). Severe stripe rust foci were found in some fields in this area, but in general active rust pressure was low

and restricted to the lower leaves. Weather remains conducive to further spreading of the disease. Previously, stripe rust was found in variety trials in southeastern Washington (Walla Walla) where disease incidence and severity were high from mid March through April.

Oregon – In early May, wheat stripe rust was found in the southern Willamette Valley on several susceptible varieties in variety trials and was found in commercial fields in the northern part of the Willamette Valley. Weather conditions remain conducive to further spreading of the disease. Previously, stripe rust was observed at high incidence and severity throughout March and April in variety trials in northeastern Oregon (Hermiston and Pendleton-Ruggs).

Idaho – New reports of stripe rust have not been received since the previous bulletin. Previously, stripe rust was reported in late April at multiple locations including fields across western (Parma County), south-central (Twin Falls County; on 'Everest') and in southeastern (Power County; on 'SY Ovation') Idaho.

Southeast Area

Louisiana – Additional reports have not been received since the last bulletin. Previously it was noted that stripe rust developed early in the season in Winnsboro. Although stripe rust was widespread throughout the area this spring, it was not a serious problem.

Mississippi – Additional reports have not been received since the last bulletin. Previously, it was reported that stripe rust was common by mid April in the western and delta regions of the state.

North Carolina – Additional reports have not been received since the initial observation in February of stripe rust on a susceptible variety in a single southern North Carolina field.

Mid-Atlantic Area

Delaware, Maryland, and Virginia – On May 10, wheat stripe rust was reported as severe in coastal Virginia (Painter). Previously, stripe rust was observed in early April in Virginia and southern Delaware and reached Maryland by mid April.

Plains Area

Texas – Additional reports of stripe rust have not been received since the initial observations. Previously, stripe rust was observed at low incidence in February on highly susceptible border plots in research fields throughout Central and South Texas. Increased temperatures in March hampered further disease progression.

Oklahoma – In early May, both active and inactive stripe rust was observed in central Oklahoma fields (west of Stillwater) and in north central nurseries (Lahoma). Reports in mid May indicated that stripe rust contributed to significant flag leaf damage in central Oklahoma, though leaf rust was more prevalent. Previously, mixed infection of stripe rust and leaf rust was reported in late April around Stillwater. Stripe rust was observed as early as late March in southern Oklahoma before reaching the central region by early April.

Kansas – Stripe rust has persisted in central Kansas through early May and has progressed to the upper canopy in some areas. The disease remains most severe in the southeastern counties (Allen, Crawford, Cherokee, Cowley, Labette, Montgomery) where infection had progressed to the upper leaves in late April. The range of infection expanded into the northwest and west-central portions of the state in early May.

Tennessee – No new observations of stripe rust have been reported since the initial low to moderate infection on soft red winter wheat in western Tennessee during early to mid April.

Nebraska – In the first week of May a survey was performed along 200 miles of wheat fields in southern Nebraska bordering Kansas. Stripe rust was found at trace levels in a majority of the fields surveyed. Previously, stripe rust

was reported in late April at moderate to high incidence in fungicide trial plots in southeast Nebraska (Lancaster County) affecting leaves mostly at trace (10%) levels throughout the entire canopy with pockets of higher severity infections (up to 50%). Stripe rust was also previously reported in south-central Nebraska (Nuckolls County) and in a probable overwintering focus in the northern panhandle (Sheridan County).

Colorado – Stripe rust has not been reported this year despite late fall observations.

South Dakota – On May 6, wheat stripe rust was found at low incidence and low severity in a single winter wheat field in Hand County. Winter wheat in this area is starting to joint. Stripe rust was absent from five neighboring counties surveyed to the west of Hand County (Hyde, Hughes, Sully, Stanley and Lyman Counties).

Montana – On May 5, an overwintering focus was reported in southwestern Montana (Bozeman) concentrated in the lower canopy. Stripe rust was also present in south-central Montana (Big Horn and Yellowstone counties).

Midwest Area

Minnesota – On May 15, trace levels of stripe rust was observed on winter wheat in St. Paul experimental plots.

Wisconsin – Additional reports have not been received since the last bulletin. Previously, stripe rust was found in south-central Wisconsin (Sharon) in March as well as in a central Wisconsin (Arlington) production field and in southeastern fields (Kenosha County) in late April.

Kentucky – Additional reports have not been received since the last bulletin. Previously, a single report was submitted in mid April indicating active rust in a western Kentucky field on wheat near heading.

Indiana – Additional reports have not been received since the last bulletin. Previously, stripe rust was reported at low incidence and low severity in the far southwestern part of the state (Posey County) in late April on wheat at or near heading.

Canada

Alberta – No new observations of stripe rust have been reported since the mid April report of a probable overwintering focus on winter wheat at the Lethbridge research station.

Ontario – On May 4, stripe rust was found at very low incidence on the known susceptible winter wheat variety 25R46 in a grower's field (Essex County). Similar to last year at this time, stripe rust was observed in the mid canopy, but was absent on the lower leaves. By mid May stripe rust was found on 25R46 across several counties in southern Ontario (Essex, Oxford, Elgin, and Bruce Counties) as well as on an experimental line in a winter wheat nursery in Chatham-Kent County.

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. Oat stem rust devastated Louisiana crops in portions of the state this year. Notably, severe lodging, due primarily to oat stem rust infection, was reported in northern experimental plots on May 12. Previously, it was noted that stem rust was observed unusually early in Louisiana (northeast in late February) and was severe in Baton Rouge by early to mid April. Oat stem rust was also observed in March in southern Texas (Uvalde, Castroville, Corpus Christi). No additional reports have been received from Texas or other states. Two races, TGN and TJS, have been identified in some of the samples collected from the southern US. 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 Louisiana in early May. Previously, it was noted that crown rust developed early in the Southeast and southern Plains Areas and continued to develop through late April.

Southeast Area

Louisiana – Crown rust hit oats hard in Louisiana this year, which contributed (along with severe oat stem rust infection) to lodging in experimental plots in north Louisiana. It was previously reported that oat crown rust first developed in early February in the South (Baton Rouge) and progressed quickly to the Northeast (Winnsboro).

Mississippi – No new reports have been received in May. Previously, oat crown rust was observed in the eastern part of the state (Hattiesburg and Newton) in mid April, but was not found in the central and western surveyed areas (Jackson or Stoneville).

Plains Area

Texas – Oat crown rust affected coastal (Corpus Christi) and inland (Uvalde) southern crops this year. Widespread infections were reported in these areas throughout mid to late March. Crown rust continued to develop through April in Corpus Christi including late development on varieties that appeared to have early resistance. High levels of telia was observed in the upper canopy (including flag leaves) in Corpus Christi plots in the latter half of April.

Midwest Area

Minnesota – On May 9, Pycniospores were observed in the Buckthorn nursery in St. Paul, MN.

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

Barley leaf rust. On May 10, barley leaf rust was very heavy and widespread on crops in eastern Virginia (Painter). Previously, barley leaf rust was observed in mid April throughout southern Maryland and Delaware.

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

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

Rust on barberry. Rust infections (pycnial stage) on common barberry (*Berberis vulgaris*) have been observed in southern Minnesota. Past studies indicated that these infections were of *Puccinia graminis* f. sp. *secalis*, the special 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 pseudostriiformis* (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.

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

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!

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

