



# CEREAL RUST BULLETIN

Issued by:

**Cereal Disease Laboratory**

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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 reported early in the Southeast Area with new reports during the latter half of April in Arkansas and Georgia.
- Wheat leaf rust has persisted throughout the southern Great Plains and remains the predominant threat in the Southeast Area.
- Wheat stripe rust is widespread across the country with notable disease progression into the upper canopy in Kansas and Nebraska as well as continued spreading of the disease throughout the Pacific Northwest.
- Oat crown rust continues to develop in the Southeast and southern Great Plains Areas.
- *2016 Wheat leaf rust race survey results are now available.*
- *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](#), significant precipitation accumulated throughout most of the country in the latter half of April. Bouts of storms and lingering wet field conditions across the Pacific Northwest, northern Plains, and upper Midwest Areas slowed fieldwork, delayed planting, and hindered previously sown crop development in many states. Abnormally dry or drought conditions persisted throughout Oklahoma, western Kansas, eastern and central Colorado, and into southern Nebraska. Parts of Georgia have remained under extreme drought through April and abnormally dry to severe drought conditions linger in the surrounding area. In early to mid April, lower than normal temperatures were experienced in the Pacific Northwest, while much of the rest of the country experienced temperatures >8 degrees above average. In the latter half of April, temperatures returned closer to seasonal averages throughout the Plains, Midwest, and Pacific Northwest Areas. Conversely, extremely hot weather was experienced in parts of the Southeast and in the Ohio Valley.

**Crop conditions.** According to the [USDA National Agricultural Statistics Service](#), on April 30, 54% percent of the winter wheat crop was reported in good to excellent condition nationwide compared to 61% last year at this time. Forty-two percent of the winter wheat has headed, eight percentage points ahead of the previous five-year average. By April 30, 31% of the spring wheat crop was planted, fifteen percentage points behind the 5-year average, and nine percent of the spring wheat had emerged, compared to an average of 17% of the crop over the previous 5-year period. Sixty-seven percent of the oat crop was sowed and 47% had emerged by April 30, compared to an average of 70% and 50%, respectively, over the past five years. Thirty-two percent of the barley crop was planted, falling 21% behind the 5-year average, and 14% of the crop had emerged compared to an average of 21% of the crop over the previous five-year period.



**Wheat stem rust.** It was previously noted that cereal grains were stem rust free this spring in the Lower Rio Grande Valley, likely a result of extensive drought in the region. Conversely, stem rust was observed earlier than usual in the Southeast (Louisiana, Georgia, Arkansas), though the incidences appear to be contained.

### Plains Area

*Texas* – 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. 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* – Wheat stem rust was previously reported at a research station in Crowley, Louisiana on April 17. Additional observations have not been reported.

*Georgia* – Wheat stem rust was found in Plains, GA towards the end of April. It is rare to observe wheat stem rust in this area particularly this early in the season.

*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.

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

**Wheat leaf rust.** In the latter half of April, leaf rust infections persisted throughout the southern Great Plains (Texas, Oklahoma, and Kansas) and the Southeast (Louisiana and Mississippi).

### Plains Area

*Texas* – Overall, development of wheat leaf rust has been slow in southern Texas, but has progressed to high severity in some areas. Telia development was observed on both leaves and leaf sheaths of select varieties by late April in Corpus Christi. Previously, it was reported that leaf rust was present in research plots and in some farm fields throughout southeast Texas in mid February and into central Texas by late March/early April with notably higher incidence of leaf rust in Castroville experimental plots than in previous years.

*Oklahoma* – 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). However, in mid to late April, leaf rust remained the predominant disease on wheat in Oklahoma and heavy infection was observed in some plots in Lahoma (northern Oklahoma, west of Enid). Mixed infections of leaf rust and stripe rust were also observed on wheat around Stillwater. In the last week of April, active leaf rust was observed in southwestern (Altus) and central (Apache and Chickasha) Oklahoma, which contributed to significant flag leaf damage in conjunction with other fungal and viral infections. Over the past two weeks, reports of wheat maturity in southern and central regions ranged from early flowering to kernel formation (as far progressed as medium dough stage), whereas a number of northern Oklahoma growers have reported their crops are not yet flowering or are in the early stages of flowering. Significant snowfall in the far western panhandle may have caused damage or delay to the crop.

*Kansas* – Previously, leaf rust was reported at low levels in fields in south central and southeastern Kansas by mid April. In the latter half of April, infection progressed to upper leaves in select locations in Rice and Cowley Counties, which increases the risk of yield loss as plants mature to grain filling stages.

## Southeast Area

*Louisiana* – There have been no new reports of leaf rust in Louisiana since the last bulletin. Previously, however, leaf rust was reported at increasingly high severity in southern Louisiana by mid April.

*Mississippi* – Leaf rust has been active since January throughout the state and remains the main cereal disease in southern Mississippi as of the last report on April 18.

**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.** In the Pacific Northwest, wheat stripe rust persisted throughout southeastern Washington and eastern Oregon and has spread into Idaho. Wheat stripe rust was relatively mild this year in the Southeast Area, but was observed across Louisiana, Mississippi, and North Carolina. Stripe rust has been widespread throughout the Plains Area, with greatest severity in late April in Kansas and Nebraska where infection has been observed on both lower and upper leaves in select counties. In the Midwest, stripe rust was reported for the first time this season in southern Indiana and additional observations were reported in southeastern and central Wisconsin.

## Pacific Northwest Area

*Washington and Oregon* – On May 1, reports indicated that weather and field conditions remained conducive to further spreading of stripe rust throughout eastern Oregon and southeastern Washington. Stripe rust was found in variety trials in northeastern Oregon (Hermiston and Pendleton-Ruggs) and in southeastern Washington (Walla Walla). This is not surprising given that stripe rust was found in 80% of 70 fields checked in the region in early to mid March with the most activity in Walla Walla, WA and Pendleton, OR, where areas of high incidence and severity were observed.

*Idaho* – Stripe rust was first reported in Idaho on April 25 in multiple locations. It was observed in Parma (northwest of Boise near the Oregon border) on lower and middle leaves, in south-central Idaho (Twin Falls County) on ‘Everest’ on middle to younger leaves, and in southeastern Power County on ‘SY Ovation,’ also on younger leaves. Throughout the region, the crop is reported at early jointing to late tillering stages. Weather conditions favor further spreading.

## Southeast Area

*Louisiana* – By mid to late April, wheat was at physiological maturity for many varieties. Though widespread throughout the state, stripe rust was a fairly minor problem this season. Previously, stripe rust was reported early in Winnsboro, LA research plots and continued to spread throughout early spring.

*Mississippi* – In the western and delta regions of the state, stem rust was common in wheat fields by mid to late April, though hard to come by since wheat acreage is down compared to previous years.

*North Carolina* – Previously, wheat stripe rust was observed in late February in a single field in southern North Carolina on a known susceptible variety. Additional observations have not been reported.

### Northeast Area

*Delaware, Maryland, and Virginia* – Previously, stripe rust was reported in early April in Virginia and southern Delaware and was observed in Maryland by mid April near the Delaware boarder. Additional observations have not been reported.

### Plains Area

*Texas* – There have been no new reports of stripe rust in Texas since the last bulletin. Previously, stripe rust was reported at low incidence throughout Central and South Texas in February on highly susceptible border plots in research fields and disease progression slowed in March as temperatures increased.

*Oklahoma* – In late April, stripe rust was observed around Stillwater, but was secondary in incidence to more widespread leaf rust. Co-infection of both rusts was occasionally observed on the same leaves. Maturity of wheat in the area is varied, but nearing grain formation. Previously, stripe rust was observed in southern Oklahoma in late March and had reached the central region by early April.

*Kansas* – Stripe rust was widespread throughout Kansas by late April with observations across many central, southern, and southeastern counties. The disease is most severe in the southeastern counties (Allen, Crawford, Cherokee, Cowley, Labette, Montgomery) where infection has progressed to the upper leaves. Fortunately, the higher temperatures throughout mid to late April did not favor further spreading. The southeastern region of the state has been hit much worse than the central region in which severity remained low and infection was restricted to the lower leaves.

*Tennessee* – No new observations of stripe rust have been reported in since the previous bulletin. Previously, low to moderate stripe rust was observed on soft red winter wheat in western Tennessee during early to mid April.

*Nebraska* – On April 27, stripe rust was reported at moderate to high incidence in fungicide trial plots in southeast Nebraska (Lancaster County) affecting leaves throughout the entire canopy. Severity was observed at trace to 10% for a majority of leaves, though some were scored at greater than 50% severity. Just north of this location in Mead stripe rust was not found, but low levels of stripe rust were reported in south central Nebraska (Nuckolls County). Weather in the region this past week favored further spreading of the disease and wheat maturity was reported at or nearing boot stage, which prompted some concern over potential yield loss if the infection continues to spread. Previously, stripe rust was found in the northern part of the Nebraska panhandle (Sheridan County) that is believed to have overwintered from widespread infection last fall.

*Colorado* – Though stripe rust was reported in late fall 2016, it does not appear to have overwintered and activity is yet to be observed in the state this spring.

### Midwest Area

*Wisconsin* – On April 20, stripe rust was found on a known susceptible variety ‘Pro Seed 420’ in a winter wheat production field north of Madison (Arlington, WI). It is suspected that this was an overwintering focus similar to the previous report of active stripe rust in the south (Sharon, WI) in March. Furthermore, stripe rust was reported in Kenosha County, which is north of the Illinois border on Lake Michigan and situated east of the first report in Sharon.

*Kentucky* – On April 14, stripe rust was observed in a western Kentucky field where most wheat is at or near heading.

*Indiana* – On April 21, stripe rust was reported at low incidence and low severity in the far southwestern part of the state (Posey County). Most wheat is at or near heading across southern Indiana.

## Canada

*Alberta* - No new observations of stripe rust have been reported since the previous bulletin. Previously, a probable overwintering focus of stripe rust was reported on winter wheat at the Lethbridge research station in mid April.

**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.** There have not been any new observations of oat stem rust in late April. Previously, it was noted that stem rust was observed unusually early and further north than typical. In Louisiana, it was seen in the Northeast in late February and was reported as severe in Baton Rouge by early to mid April. Oat stem rust was also observed in March in southern Texas (Uvalde, Castroville, Corpus Christi).

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

**Oat crown rust.** Following early observations in the Southeast and southern Plains Areas, oat crown rust continued to develop throughout the region in late April.

## Southeast Area

*Louisiana* – There have been no new reports of oat crown rust since the last bulletin. It was previously reported that the Louisiana oat crop was three weeks ahead of its typical maturity schedule due to a warm winter. Oat crown rust infections developed early in February in the South (Baton Rouge) and appeared further north by mid February (Winnsboro).

*Mississippi* – On April 18, oat crown rust was observed in the eastern part of the state (Hattiesburg and Newton), but was not found in the central and western surveyed areas (Jackson or Stoneville).

## Plains Area

*Texas* – Previously, widespread oat crown rust infections were reported in Corpus Christi and Uvalde throughout mid to late March. Through late April, crown rust continued to develop on oat in Corpus Christi including late development on varieties that appeared to have early resistance. Notably, high levels of telia was observed on upper leaves and flag leaves in Corpus Christi plots in the latter half of April.

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

**Barley leaf rust.** Barley leaf rust was observed throughout southern Maryland and Delaware in mid April. Additional observations have not been reported since the last bulletin.

**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.

## 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.
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!**