



CEREAL RUST BULLETIN

Issued by:

Cereal Disease Laboratory

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<http://www.ars.usda.gov/Main/docs.htm?docid=9970>

Or, send an email to: oluseyi.fajolu@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 from Texas.
- Severe wheat leaf rust was observed in Nebraska.
- Wheat stripe rust has been reported from fourteen states, and disease pressure varied across regions.
- Oat crown rust was found in Texas, Louisiana, Minnesota, and South Dakota.
- Barley leaf rust is present in Washington.
- Barley stripe rust is severe on susceptible variety in western Washington.
- *2020 wheat leaf rust race survey results are available.*
- *Request for cereal rust observations and samples in 2021*

For original, detailed reports from our cooperators and CDL staff, please visit the [Cereal Rust Situation](#) (CRS) reports page on the [CDL website](#).

Weather conditions. According to the “USDA Weekly Weather and Crop Bulletin” and the “Daily U.S. Agricultural Weather Highlights” released on June 8 and 11, torrid weather persisted across the northern Plains and upper Midwest. The temperature was more than ten degrees F above average in parts of Minnesota, Montana, and the Dakotas. Daily highs for June 4–5 rose to triple-digits resulting in the highest June temperatures on records: 105 F in Minot, ND, 104 F in Aberdeen, SD, and 100 F in Moorhead, MN. Thunderstorms moved through parts of the Midwest on June 11 and deposited desired, scattered showers. The Northwest experienced similar weather conditions with a daily record of 104 F in Pasco, WA and 101 F in Lewiston, ID, during the first week of June. The hot and dry weather advanced winter wheat maturation and harvest in the southern Plains but caused drought that stressed cereal crops in other parts of the Plains and upper Midwest.

Crop conditions. According to the June 8 report, 85% of winter wheat has headed nationwide, compared to 84% at the same time last year and 86% over the past five years. As of June 6, two percent of the 2021 winter wheat acreage had been harvested, four percentage points below last year and five points behind average. Fifty percent of the nation’s winter wheat was rated in good to excellent condition, one point below last year. Ninety percent of the 2021 spring wheat had emerged, eleven percentage points ahead of last year and four points above average. On June 6, 38% spring wheat was reported in good to excellent condition compared to 82% at the same time last year. By June 6, 95% of the nation’s oat acreage had emerged, five and three percentage points above last year and the five-year average, respectively. Thirty-seven percent of the 2021 oats had headed, four and three percentage points above last year and the five-year average, respectively. Forty-six percent of the oat crop was rated in good to excellent condition, twenty-five percentage points below the same time last year. As of June 6, 87% of the nation’s barley had emerged, compared to 85% in the previous year and 86% over the past



five years. Forty-three percent of the 2021 barley was reported in good to excellent condition, thirty-six percentage points below the same time last year.

Wheat stem rust. There have been no new observations of wheat stem rust since it was reported from Texas (see [Cereal Rust Bulletin #1](#)). A wheat stem rust sample collected from Castroville, TX was identified as race QFCSC.

Wheat leaf rust. Severe leaf rust was observed in Nebraska. In general, 2021 leaf rust pressure varied from high to moderate to low levels. To date, leaf rust has been reported from Texas, Louisiana, Oklahoma, Kansas, Nebraska, Minnesota, Virginia and Maryland (see [Cereal Rust Bulletin #1 and #2](#)).

Oklahoma – Wheat tours in the mid to the third week of May covered El Reno (Canadian County), Cherokee (Alfalfa County), Lahoma (Garfield County), Kingfisher (Kingfisher County), Alva (Woods County), Buffalo (Harper County), Morris (Okmulgee County) in central, north-central, south-central, northwestern, and eastern Oklahoma. Diseases observed at these locations varied widely. Light foliar diseases and no rust was observed at Cherokee, Alva, and Buffalo. Leaf rust was found in Kingfisher, Morris, El Reno, Lahoma, and around Stillwater. At the time of tours, wheat growth stages ranged from kernels just forming to fully formed. Previously, leaf rust was reported from trials around Stillwater and near Perkins (see [Cereal Rust Bulletin #1](#)).

Kansas – Leaf rust has progressed but at low levels in most areas of the state. Moderate levels of the rust were observed near McPherson in central Kansas. The disease had reached 10 – 20% severity on susceptible varieties such as T158 and Larry. Previously, low levels of leaf rust were reported from several counties (see [Cereal Rust Bulletin #2](#)).

Nebraska – On June 1, heavy leaf rust was observed in trial plots at Havelock Farm in Lincoln, Lancaster County, southeast Nebraska. Flag leaves of susceptible varieties were covered with rust pustules, and entire plots appeared brown from leaf rust. To date, leaf rust was found in Lancaster, Nemaha, and Seward counties.

Minnesota – Leaf rust was observed at trace level in plots of susceptible winter wheat in St. Paul (Ramsey County) on June 3.

Virginia – On May 25, leaf rust was observed at 90% severity and 60% incidence on different lines in the Virginia variety trial at Warsaw in Richmond County. The high disease pressure occurred late in the season and probably has little to no effect on yield. Wheat was at the soft dough growth stage. Previously, light wheat leaf rust was found in a disease nursery at Painter in Accomack County (see [Cereal Rust Bulletin #2](#)).

Maryland – Three collections of wheat leaf rust were received at the Cereal Disease Laboratory from Howard and Queen Anne's counties in Maryland.

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](#)

2020 wheat leaf rust survey summary and results are available.

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

Wheat stripe rust. Stripe rust was severe in most of the central Plains states and western Washington. The disease has started to develop in the Midwest but might be hampered by the hot and dry weather conditions. So far this year, stripe rust has been reported from fourteen states: Louisiana, Texas, Washington, Oklahoma, Tennessee, Arkansas, California, Oregon, Mississippi, Kansas, Nebraska, Ohio, South Dakota, and Minnesota.

Washington – As usual, stripe rust was severe in the wheat nurseries at Mount Vernon in Skagit County, western WA. By the end of May, the disease had reached 80% and 100% severity on susceptible spring and winter wheat varieties, respectively. Leaf rust was not observed on wheat crops at this location. Winter wheat ranged from boot to flowering, and spring wheat was at early jointing growth stages. Wheat fields in Grant, Adams, and Whitman counties in eastern WA surveyed on May 27 were generally dry, and hence, no stripe rust was found. In the experimental fields around Pullman (Whitman County), the disease has not developed beyond the first report of a spot with stripe rust on a few leaves (see [Cereal Rust Bulletin #2](#)). According to Xianming Chen, this is the lowest stripe rust level seen at this time in the Pullman area over the past years. Winter wheat ranged from late jointing to heading growth stages.

Oklahoma – During the wheat tours made in the third week of May, stripe rust remains the prevalent foliar disease at Kingfisher, Morris, El Reno, Lahoma, and around Stillwater. Previously, severe stripe rust was reported in OK and was the predominant foliar disease in some areas of the state (see [Cereal Rust Bulletin #2](#)).

Kansas – Noticeable stripe rust damages in research plots and untreated fields were observed during the wheat tour across south-central KS on May 27. *Puccinia striiformis* had stopped active sporulation. Infected leaves were tan with necrotic stripes and appeared scorched. Susceptible varieties such as Everest, WB4269, and SY Benefit were almost defoliated by the rust. Varieties with intermediate resistance to stripe rust such as WB Grainfield, SY Monument, and LCS Chrome were rated 20 – 40% severity. Resistant varieties T158, Doublestop CL Plus, SY Rugged, Larry, TAM114, and Joe remained effective against the fungus population in the 2021 growing season. Many growers applied fungicide to control stripe rust in their commercial fields. Stripe rust is active in Northwest KS but at low levels in the mid-canopy. The previous report indicates widespread stripe rust across the state (see [Cereal Rust Bulletin #2](#)).

Nebraska – Low levels of stripe rust were observed in wheat fields surveyed during the last week of May in Lancaster, Saunders, Lincoln, Keith, Deuel, Kimball, Banner, Morrill, and Cheyenne counties in southeast, west-central, southern NE, respectively. Some of these growers' fields were treated with fungicide to control the fungus. Wheat growth stages ranged from flag leaf emerging to heading. Stripe rust in the research plots at Havelock Farm in Lincoln (Lancaster County) progressed rapidly from trace level observed on May 24 to severe infection of flag leaves on susceptible varieties on June 1. Stripe rust has been reported from nineteen counties in the state.

South Dakota – Low levels of stripe rust were observed in a few fields in Brookings County during the wheat scout across the state in the first week of June. Winter wheat growth stages ranged from boot to flowering. The weather conditions are dry and hot, thus retarding stripe rust development.

Minnesota – Several infection foci of stripe rust were found in winter wheat plots in St. Paul on June 3. Disease severity at the infection foci was up to 50%. Infected leaves were on the mid to upper canopy, indicating recent infection from an external source of inoculum. Traces of stripe rust was found in a spring wheat plot nearby. Winter wheat ranged from heading to early anthesis, and spring wheat from jointing to early booting growth stages. Previously, stripe rust was reported on a single leaf of SY Ingmar spring wheat in Yellow Medicine County.

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 crown rust. Oat crown rust was observed in Texas, Minnesota and South Dakota. Previously, severe oat crown rust was reported from Louisiana (see Cereal Rust Bulletin #1).

Texas – Eight collections of oat crown rust were received at the Cereal Disease Laboratory from Brazos and Bexar counties in Texas. Disease severity and incidence ranged from trace to 80%.

South Dakota – A low incidence of oat crown rust was observed on June 10 in the advanced yield trials at Volga in Brookings County. The oat crop was at the heading growth stage.

Minnesota – On June 3, oat crown rust infection was observed on oat in the buckthorn nursery at St. Paul. The disease appeared earlier this year than in the past years.

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

Barley leaf rust. In late May, barley leaf rust was found on a few varieties in winter nurseries at Mount Vernon, WA.

Barley stripe rust. Stripe rust had developed up to 80% severity on susceptible winter barley and 40% on spring barley in the cereal nurseries at Mount Vernon, WA. Barley stripe rust has also been reported from California and Oregon.

Rust infections on barberry. Moderate to heavy aecial infections on common barberry were observed in Door and Manitowoc counties in WI and light infection in southeast MN.

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). If you are able, please collect rust samples and send them to us. We sincerely thank all those who have assisted us in the past and hope the assistance continues this year and in the future.

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: Dr. Oluseyi Fajolu (oluseyi.fajolu@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 the following:

- 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, 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 2 – 3 days 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 this address:

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

**** Stripe rust collections should be sent by FedEx or UPS to:**

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 Dr. Xianming Chen, Phone 509-335-8086; e-mail: xianming@wsu.edu or xianming.chen@ars.usda.gov

Thank you in advance for your assistance!

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 Dr. Oluseyi Fajolu (oluseyi.fajolu@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.