



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: 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>)

- There have been no new observations of wheat stem rust since it was reported from Texas.
- Wheat leaf rust has been reported from thirteen states.
- Severe wheat stripe rust was found in Nebraska and South Dakota.
- Oat crown rust is widespread in New York.
- There have been no new observations of oat stem rust since it was reported from Texas.
- Barley leaf rust was reported from New York and Washington.
- Rye leaf rust was frequently found in New York.
- *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 in June and July 7, record-breaking high temperature prevailed in the Northwest in June into July. The temperature in the past week averaged at least 10 – 20 F above normal, and the daily record high was 117 F in Pendleton, OR, and Omak, WA. The heat spread across the northern Plains and upper Midwest with triple-digits temperature in Montana and the Dakotas. Meanwhile, central and southern Plains and part of the Midwest experienced showers that benefited summer crops. In the Northeast, above-average temperatures persisted, and the daily high was 100 F at New York’s LaGuardia Airport and Boston, MA on June 30. The Western and Northern record-setting heat accompanied by dry weather compounded drought stress on small grains, especially crops at reproduction. Thus, grain yield potential was diminished and led to the harvest of some small grains as forages.

Crop conditions. According to the July 7 report, 45% of the 2021 winter wheat acreage had been harvested, compared to 54% at the same time last year and 53% over the past five years. As of July 4, forty-seven percent of the nation’s winter wheat was reported in good to excellent condition, four percentage points below last year. Sixty-nine percent of spring wheat has headed nationwide, ten percentage points ahead of the previous year and seven points above average. On July 4, sixteen percent of the spring wheat was rated in good to excellent condition, fifty-four percentage points below the same time last year. By July 4, 88% of the nation’s oats had headed, five percentage points above both last year and the five-year average. Thirty-four percent of the 2021 oats were rated in good to excellent condition, twenty-eight percentage points below the same time last year. Fifty-nine percent of barley had headed nationwide, two percentage points ahead of last year

but equal to the five-year average. As of July 4, 22% of the barley acreage was rated in good to excellent condition, compared to 73% at the same time last year.

Wheat stem rust. There have been no new observations of wheat stem rust since it was reported from Texas, and race QFCSC was identified from the stem rust sample collected (see [Cereal Rust Bulletin #3](#)).

Wheat leaf rust. Recent reports indicate absent or low leaf rust in most fields with isolated moderate to high severity on susceptible varieties. The hot and dry late spring into summer in many wheat-growing regions have limited wheat leaf rust. Previously, the disease was reported from Texas, Louisiana, Oklahoma, Kansas, Nebraska, Minnesota, Virginia, and Maryland (see [Cereal Rust Bulletin #3](#)).

Colorado – Ten field trial sites across Colorado were visited during the State Wheat Field Days in the third week of June. Low levels of leaf rust were observed in several fields in the eastern counties of the state. Most of these fields were co-infected with both leaf rust and stripe rust.

South Dakota – Moderate levels of leaf rust were observed in some winter wheat varieties and breeding lines in the trials at Hughes and Brookings Counties. The field in Hughes County was irrigated once, which provided some moisture for leaf rust development. Winter wheat ranges from soft dough to turning color growth stages. Many wheat fields across the state are stressed by the prolonged hot and dry weather conditions. Thereby, little to no rust diseases were observed in most fields visited in June. No rust has been reported in spring wheat in the current growing season. Spring wheat ranges from heading to flowering. Some of these fields were harvested for hay due to heat and drought stress.

Minnesota – Wheat leaf rust was found only on the susceptible cultivar Morocco at low to moderate levels during the cereal rust survey at the University of Minnesota Southern Research Center, Waseca, on July 7. No rust was observed in the spring wheat plots. The combination of continuous hot and dry weather with a lower amount of rust spores from the South has limited the rust diseases on wheat crops in Minnesota and the Dakotas. The spring wheat was at grain filling. Previously, a trace amount of leaf rust was found in plots of susceptible winter wheat in Ramsey County (see [Cereal Rust Bulletin #3](#)).

New York – Wheat leaf rust is seen in many fields across the state at moderate incidence but low severity. The disease developed late in the growing season and probably will have little to no effect on yield. The disease was found on different varieties including, Medina and NY11013-10-15-1312 white winter wheat, Erie, and Pioneer 25R40 soft red winter wheat. Neither stripe rust nor stem rust has been observed in New York this year.

Georgia – Five collections of wheat leaf rust were received at the Cereal Disease Laboratory from Pike and Sumter counties in Georgia.

North Carolina – A collection of winter wheat USG3209 with severe leaf rust was received at the Cereal Disease Laboratory from Plymouth, NC, on July 6. Plots of this susceptible cultivar were rated 90S in late May. Widespread but moderate wheat leaf rust was reported from the Coastal Plain and Tidewater regions of the state.

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. Severe stripe rust was reported from Nebraska and South Dakota in June despite the high temperature and drought conditions. So far this year, wheat stripe rust has been reported from fifteen states: Washington, Oregon, California, Colorado, Louisiana, Texas, Oklahoma, Kansas, Nebraska, South Dakota, Minnesota, Mississippi, Arkansas, Tennessee, and Ohio.

Colorado – Wheat stripe rust was found in sixteen counties across eastern Colorado during the wheat fields visit in the third week of June. The disease incidence and severity were low in most counties, but moderate severity was observed in Lincoln County. However, the flag leaves were not infected at the time of the survey.

Nebraska – Wheat disease surveys were conducted in Perkins, Red Willow, Cheyenne, Banner, Box Butte, and Deuel counties during the third week of June. Wheat ranged from milk to ripening growth stages. Stripe rust incidence and severity were high in the state variety trial at Deuel County but were moderate at the High Plains Ag Lab field in Cheyenne County. There was no foliar disease observed in the state variety trial at Banner County. Some wheat varieties at this location were severely drought-stressed. Some fields in the Panhandle area were treated with fungicide to control stripe rust, and disease in untreated fields was retarded by the high temperature and drought. Although the heat and dry weather conditions significantly slow down rust development, they do not eliminate the infection that occurred when conditions for infection and disease development were favorable. The wheat fields in Cheyenne and Deuel Counties are perfect examples. Stripe rust infection was observed in these fields shortly after the torrential rain in that region in late May, according to Stephen Wegulo. Moreover, these locations were on high elevations which make nighttime temperatures cool and leads to dew formation, thus providing an environment for stripe rust development. Previously, wheat stripe rust was reported from nineteen counties in the state and severe in a research field in Lancaster County (see [Cereal Rust Bulletin #3](#)).

South Dakota – Low levels of stripe rust were reported from a winter wheat research field at Hughes County on June 28. However, severe stripe rust occurred in a variety trial at Brookings County despite the high temperature and dry weather conditions. The Extension Plant Pathologist, Emmanuel Byamukama, speculated the possibility of heat tolerant *Puccinia striiformis* isolates on the field and sent samples for testing. Previously, low amounts of stripe rust were observed in Brookings County (see [Cereal Rust Bulletin #3](#)).

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 has been reported from Texas, Louisiana, Minnesota, South Dakota, New York, and Georgia in the current growing season (see [Cereal Rust Bulletin #3](#)).

South Dakota – On June 23, high oat crown rust was found on one variety in a commercial field in Brookings County. The plants with severe rust were by the shelterbelt, which prevented direct heat and provided extended dew periods leading to needed moisture for crown rust development. The plants of the same variety in non-shelterbelt on the same field had no crown rust. Elsewhere, low levels of oat crown rust were observed. The oat crop was at the heading growth stage. Previously, a low incidence of oat crown rust was observed in the advanced yield trials at the Volga in Brookings County (see [Cereal Rust Bulletin #3](#)).

New York – Oat crown rust is widespread across the state but not a problem in growers' fields. Unfortunately, crown rust continued to infect oat varieties resistant to *Puccinia coronata* in the past years. Crown rust samples from Hayden, Steuben, and SD11946 varieties were sent to the Cereal Disease Laboratory.

Georgia – Two collections of oat crown rust were received at the Cereal Disease Laboratory from Sumter County in Georgia.

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

Oat stem rust. There have been no new observations of oat stem rust since it was reported from Texas (see [Cereal Rust Bulletin #1](#)).

Barley leaf rust. Barley leaf rust was frequently found but at low severity on different varieties, including Quest and Excelsior Gold, in fields in New York. Previously, barley leaf rust was reported on winter nurseries at Mount Vernon, WA (see [Cereal Rust Bulletin #3](#)).

Rye leaf rust. Low severity but moderate incidence levels of rye leaf rust were observed in variety nurseries in Ithaca, New York. The disease was found in different varieties such as winter rye Brasetto and Hazlet.

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.