CEREAL RUST BULLETIN

Issued by:

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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 found in Texas.
- Wheat leaf rust was reported from Texas, Louisiana, Oklahoma, Kansas, and Virginia.
- Wheat stripe rust is severe in Oklahoma and spreading across Kansas. To date, stripe rust has been reported from twelve states.
- There have been no new observations of oat crown rust and oat stem rust since they were reported from Louisiana and Texas, respectively.
- Barley stripe rust is present in California and 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 "U.S. Agricultural Weather Highlights" released on May 18, local heavy rain and thunderstorm in the central and southern Plains slowed fieldwork but favored winter grains and spring crops. Dodge City, KS, recorded a weekly sum of 1.63 inches of rain. The North, especially the Northwest, and from the Dakotas to Michigan experienced drought, stressing winter wheat and spring crops. The topsoil moisture was rated 81% short in North Dakota and 58% in Montana on May 16. The weekly average temperature was at least 5ºF below normal across most parts of the Plains, Midwest, mid-South, and mid-Atlantic. On May 11, the high temperature in Goodland, KS, was 46ºF, and in Amarillo, TX, 49ºF. Freezing temperature across the North slows down the development of winter grains and the growth of spring crops.

Crop conditions. According to the May 18 report, 53% of winter wheat has headed nationwide, compared to 54% at the same time last year and 58% over the past five years. Forty-eight percent of the 2021 winter wheat crop was rated in good to excellent condition, four percentage points below last year. Eighty-five percent of the nation's spring wheat was seeded, twenty-eight percentage points ahead of last year and fourteen points above the five-year average. Forty-seven percent of the nation's spring wheat had emerged, nineteen percentage points higher than last year and eleven points above average. On May 16, 92% of the nation's oat crop was seeded, seven percentage points above last year and eight points above average. Seventy-three percent of the oat acreage had emerged, six percentage points higher than last year and seven points above average. Forty-nine percent of the oat crop was rated in good to excellent condition, twenty-six percentage points below the same time last year. As of May 16, eighty-three percent of the 2021 barley acreage was planted, thirteen and

seven percentage points above last year and the five-year average, respectively. Fifty percent of the nation's barley had emerged, nine percentage points above last year and six points above average.

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

Wheat leaf rust. Leaf rust was found in Kansas and Virginia. Previously, wheat leaf rust was reported from Texas, Louisiana, and Oklahoma (see Cereal Rust Bulletin #1).

Kansas – In early May, wheat leaf rust was confirmed at low levels in Riley, Wabaunsee, Pratt, and Kingman Counties, and in several other counties by mid-May. Leaf rust is expected to continue to develop.

Virginia – During a state disease tour made in the second week of May, light wheat leaf rust was found on susceptible variety Massey in a disease nursery at Painter in the eastern part of the state. In general, there was little to no disease in the wheat fields visited.

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 is severe in Oklahoma and spreading across Kansas. So far this year, wheat stripe rust has been reported from twelve states: Louisiana, Texas, Washington, Oklahoma, Tennessee, Arkansas, California, Oregon, Mississippi, Kansas, Nebraska, and Minnesota.

Oklahoma – Stripe rust incidence and severity increased rapidly from low and scattered rust reported in early April to high incidence and severe infection by the third week of April. In north-central Oklahoma, severe stripe rust was observed on susceptible variety Pete around Stillwater (Payne County) and on an unknown variety near Lamont (Grant County). A high incidence of stripe rust was found in research plots near Carrier in Garfield County. A remarkable observation was the uniform and widespread stripe rust across a nine-acre increase field with variety Triumph 64 near Perkins in Payne County. According to Bob Hunger, infection was so severe that the majority of field foliage appeared yellowish-orange due to the rust spores. This level of uniform and severe infection was probably due to the overwintering of *Puccinia striiformis* in the field. Fungicide was applied to protect the remaining green leaves, but most of the leaf tissues are damaged by the pathogen. This underlines the importance of field scouting for early disease detection and timely application of fungicide in controlling stripe rust, especially on susceptible varieties. A wheat tour was made on April 27 – 30 to Walters (Cotton County), Altus (Jackson County), and Apache and Chickasha (Caddo County) in south-central, southwestern, and central OK, respectively. Stripe rust was the most prevalent foliar disease at all locations visited except at Altus, where the weather was dry and did not favor foliar diseases. Stripe rust infections vary from light to severe across the sites. Wheat ranges from approaching flowering to past flowering. In early May, severe stripe rust was reported from trials at Tipton in Tillman County. The rust was observed in wheat heads on a field near Chattanooga. Bob stated that over the years, he seldom sees stripe rust on wheat heads, and it is indicative of severe infection in that area. In contrast, little foliar diseases were seen during the field tour to Afton, Kildare, Lamont and Homestead in Ottawa, Kay, Grant, and Blaine counties, respectively.

Kansas – In mid-April, low levels of wheat stripe rust were first reported in Wilson and Labette counties in southeastern Kansas. Wheat crop was approaching or at flag leaf emergence growth stages at that time. During a state

field scout at the end of April, stripe rust was found in an additional nineteen counties, mainly from in south and central KS. The disease was at a low incidence and restricted to the lower leaves in the majority of the field scouted. In early May, trace stripe rust was reported from counties in northern KS. To date, stripe rust is present in 46 counties, and infection has progressed to the upper canopy in sixteen counties. This is important since infection of flag leaves is a contributing factor to yield losses. The cool wet weather in many counties continues to favor stripe rust spread and development. Stripe rust was observed on many susceptible varieties as well as LCS and SY Monument, previously known to be resistant to *P. striiformis*. These resistant varieties were also infected the previous year, indicating incessant isolates that break down stripe rust resistance in the field.

Washington – Winter wheat fields in seven counties, Whitman, Adams, Lincoln, Grant, Douglas, Columbia, and Garfield, were surveyed on May 12. Wheat fields scouted ranged from jointing to heading growth stages, and the majority were dry. Of all the commercial fields visited, inactive stripe rust pustules were found in just one wheat field in Garfield County. Stripe rust hotspots were observed in irrigated breeding nurseries at Central Ferry in Garfield County. In contrast, stripe rust was hard to find in a non-irrigated germplasm screening nursery near Pullman in Whitman County. Only a spot with stripe rust on a few low leaves was seen. This is the first observation of stripe rust this season in the Palouse region. At this location, stripe rust appeared about a week later and at lower incidence compared to last year's observations. Previously, stripe rust was reported from Walla Walla and Skagit counties and none from the above seven counties when scouted in the last months (see Cereal Rust Bulletin #1).

Nebraska – Trace to low levels of stripe rust were first reported on May 10 from wheat research plots at Havelock Farm in Lincoln, Lancaster County. The disease was found in the mid-canopy. Wheat ranged from boot to heads emerging growth stages.

Minnesota – Wheat stripe rust was found on a single leaf of SY Ingmar spring wheat in Yellow Medicine County on May 18.

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 and oat stem rust. There have been no new observations of oat crown rust and oat stem rust since they were reported from Louisiana and Texas, respectively (see Cereal Rust Bulletin #1).

Barley stripe rust. Stripe rust was found in California. Previously, low levels of barley stripe rust were observed on susceptible varieties in the winter nurseries at Mount Vernon, Washington (see Cereal Rust Bulletin #1).

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.