USDA ARS CEREAL RUST BULLETIN

Report No. 9
(Final 2011 bulletin)
August 19, 2011

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
Mark.Hughes@ars.usda.gov

For the latest cereal rust news from the field, subscribe to the cereal-rust-survey listserv list. To subscribe, please visit: http://www.ars.usda.gov/Main/docs.htm?docid=9970

Or, send an email to: Mark.Hughes@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*)

For the original, detailed reports from our cooperators and CDL staff, please visit the Cereal Rust Situation reports page on the CDL website.

- Wheat stem rust was generally found scattered and at low levels in the Great Plains, Ohio Valley and Great Lakes area.
- Wheat leaf rust was widespread, but generally at low levels in the plains and eastern U.S.
- Wheat stripe rust was widespread and severe in the Pacific Northwest, Sacramento Valley in California and Montana.
- Thanks to all of our cooperators!

Wheat stem rust. Wheat stem rust was first reported in mid-April in Texas and Louisiana. Extreme drought conditions in the southern and central plains limited stem rust development and inoculum production for areas further north. Generally, wheat stem rust was found at low levels in scattered plots and fields in the Great Plains, Ohio Valley and Great Lakes region in 2011. The exception was northeastern Wisconsin, where 1 to 40% severities were found in commercial soft red winter wheat fields located within 5 miles of Lake Michigan. To date, race QFCSC is the predominantly identified race east of the Rocky Mountains; the only other race so far identified is race QCCDC from a collection made in a plot at Crowley, in south central Louisiana.

Wheat stem rust was found in areas of Texas, Louisiana, Oklahoma, Kansas, Nebraska, North Dakota, Minnesota, Arkansas, Missouri, Kentucky, Illinois, Indiana, Wisconsin and Michigan in 2011. Please visit the stem rust observation maps (http://www.ars.usda.gov/Main/docs.htm?docid=9757) and Cereal Rust Situation reports for more details. Results of race identification will be posted on the map as they become available.

Texas - Wheat stem rust was first reported in southeastern Texas in McNair 701 plots on April 15. By April 18, stem rust had been found in McNair 701 plots at Castroville and Uvalde in south central Texas and by April 23 it was found in McNair 701 plots at McGregor in central Texas. Stem rust was also found on emmer, barley and triticale used as windbreaks in watermelon fields in the Rio Grande Valley in southern Texas on April 20-21. The infection was sparse on emmer and barley with severities from trace to 20% while the triticale was highly susceptible with severities up to 80S. The persistent and widespread drought conditions limited the spread and development of stem rust in the state.

Louisiana - Trace amounts of wheat stem rust were found in plots of an unknown cultivar at Crowley in southern Louisiana on April 22.

Oklahoma - Stem rust was found in a McNair 701 trap plot at Stillwater in north central Oklahoma the week of May 9.

Arkansas - Stem rust was found late in the season in one plot at Keiser in northeastern Arkansas in mid-May.

Kansas - Low levels of stem rust (severity 1% or less, incidence 2%) were found on the susceptible cultivar Winterhawk in Barber County in south central Kansas on May 25. Stem rust was found at trace to moderate levels in plots in Sumner, Labette and Ellis counties in Kansas in early June. In north central Kansas in mid-June, stem rust was found on Winterhawk at late milk stage in two locations in Republic County. The severities ranged from 1-20% on flag leaves with incidences in the 10-15% range. Wheat stem rust was not expected to cause serious yield loss in Kansas in 2011.

Nebraska – Stem rust was found on wheat and barley at the Havelock Farm in Lincoln in Lancaster County in southeastern Nebraska on June 13.

Missouri - Low levels of stem rust were found in a field in Chariton County in north central Missouri in early June.

Indiana - Stem rust was found at low levels in a plot in west central Indiana on June 6.

Illinois - Stem rust was found in plots in central and northern Illinois in late July.

Michigan - Light to moderate stem rust severities were observed in plots in two counties in south central Michigan on the cultivar Jupiter and two nursery lines in late June and early July.

Minnesota - Stem rust was found at low levels in Panola and McNair 701 plots in southeastern Minnesota on June 24. Low levels of stem rust were found scattered across southern Minnesota in late July.

Wisconsin - Stem rust was found in plots at Arlington in south central Wisconsin and at Oconto in northeastern Wisconsin in late June; the infections at the latter site were not as full developed. By the time the plots reached maturity the fully susceptible cultivars (Ambassador, Envoy, IL05-4236) were reading 100S. Stem rust was also observed on the check cultivar Pioneer 25R47, averaging 10-20 MR/MS throughout the nursery. This is the highest level of stem rust observed in the nursery in the last eight years. Significant levels of stem rust (1- 40% severity) were found in commercial soft red winter wheat fields located within 5 miles of the Lake Michigan shoreline between Sturgeon Bay and Manitowoc in northeastern Wisconsin on July 14. The crop was maturing rapidly and was harvested by the end of July.

North Dakota - Stem rust was found in some plots (overall uncommon in the nursery) at Williston in northwestern North Dakota on July 14. Field scouts found no rust in the 137 commercial wheat fields scouted in North Dakota in early July.

Wheat leaf rust. Wheat leaf rust was first found in early March in commercial fields southwest of Houston, Texas and in a nursery in north central Oklahoma. Generally, leaf rust was widespread, but a low levels throughout plots and fields in the plains and eastern U.S. in 2011. Extreme drought conditions in the southern and central plains limited leaf rust development and inoculum production for areas further north. Additionally, widespread use of fungicide throughout most commercial fields further limited leaf rust development.

Texas – Severe leaf rust was found on the cultivar Jackpot (*Lr39/41*) in commercial fields in two counties (Colorado and Jackson) southwest of Houston the first week of March. Fungicide was applied in this area and further south. Generally, trace to low levels of wheat leaf rust were found in plots in southeastern and south central Texas in early March. However, wheat leaf rust was very active in irrigated plots at Yoakum in mid-April and could be found on flag leaves**.** By early April, leaf rust was building in plots at Castroville in south central Texas. Susceptible lines such as Jagger (*Lr17*), Jagalene (*Lr24*) and Bullet (*Lr39/41*) had 70S

severity on April 18. At Uvalde on April 18, trace amounts of leaf rust were found in a few plots, but none higher than 10% severity. The plots were drying up due to lack of moisture. The persistent and widespread drought conditions limited the spread and development of leaf rust in the state.

Oklahoma – Traces of active sporulating leaf rust were noted in a strip of Jagalene (*Lr24*) in a nursery at Stillwater (north central Oklahoma) in early March. By the end of March, the wheat leaf rust had increased only slightly. No rust samples were received at the Oklahoma State diagnostic lab by late March from western and southwestern Oklahoma where drought conditions were more severe. By mid-May, leaf rust increased up to levels of 65-80% around Stillwater where there was a bit more rain. However, leaf rust levels on susceptible cultivars were not consistent from field to field. In fields north and west of Stillwater leaf rust was at low incidence. Despite rains in some areas, extremely dry to drought conditions persisted in much of the state, particularly the western half of the state which was classified as an exceptional drought area as of May 24. Much like Texas, the persistent and widespread drought conditions limited the spread and development of leaf rust in the state.

Kansas – Trace amounts of overwintering leaf rust were found in plots near Manhattan (northeast Kansas) in mid-March. Low levels of wheat leaf rust were found in wheat at the jointing stage in southeastern Kansas and in the lower third of the canopy on known susceptible cultivars in Saline County in central Kansas in early April. By early May, low levels of leaf rust were found in central and south central parts of the state. Leaf rust was still at low levels in central Kansas in mid-May. By late May, leaf rust was still at low levels in most areas in the state. Leaf rust increased slightly in plots and fields in north central Kansas in early June. The persistent dry conditions in many areas of the state limited the development of wheat leaf rust in the state.

Nebraska – Leaf rust was found in plots at Lincoln in Lancaster County in southeastern Nebraska on June 3. Low levels of leaf rust were found in most fields surveyed in the southern tier of counties on June 10.

Minnesota –Trace amounts of leaf rust were found in plots at Rosemount in southeastern Minnesota on May 26. By June 24, leaf rust was heavy on flag leaves of susceptible cultivars and at lower levels in resistant cultivars in the plots. Low levels of leaf rust were found on the cultivar Marshall (*Lr2a, Lr10* and *Lr34*) in plots in central and northwestern Minnesota in mid-July. The cultivars Faller and Prosper, which likely have *Lr21,* had low to moderate levels of leaf rust, while other cultivars with *Lr21* had no leaf rust. Low levels of leaf rust were found across southern Minnesota in late July. Generally, leaf rust was at low levels in the northern hard red spring wheat region.

North Dakota – Trace amounts of leaf rust were found in a plot of Alsen spring wheat (*Lr2a, Lr10, Lr23, Lr34*) at Fargo, in east central North Dakota on June 30. Trace amounts of leaf rust were found on Darrell winter wheat at Jamestown in central North Dakota on June 30. These initial reports of leaf rust were about three weeks later than normal. The second week of July, leaf rust was common in plots at Williston in northwestern North Dakota, but could not be found in fields in the Dickinson area in the southwestern part of the state. Field scouts found no rust in the 137 commercial wheat fields scouted the second week of July in the state. Previously, trace amounts of leaf rust were found in plots in east central and central North Dakota. On July 28, high levels of leaf rust (20-30S) were found in plots of the cultivars Faller (*Lr21*) and Prosper (*Lr21*) at Carrington in east central North Dakota. Until last summer, these cultivars were resistant to leaf rust since they carry the gene *Lr21*. However, RB07, which also carries *Lr21*, did not have leaf rust. In plots at Fargo, both, Faller and the Thatcher line wit *Lr21* had susceptible leaf rust reactions. This follows the identification of new races of *P. triticina* in 2011 carrying *Lr21* virulence in the North Dakota and Minnesota.

Montana – Low levels of leaf rust were found on the cultivar Yellowstone near Manhattan in the Gallatin Valley in southwestern Montana on June 23. Leaf rust was also present in the Yellowstone Valley by mid-

June. Leaf rust reports had come in from throughout the state by late June. On July 12, leaf rust (100% incidence, 5% severity on flag leaves) was found in winter wheat fields south of Malta in north central Montana. Generally, leaf rust was at low levels throughout the state in 2011.

Louisiana – Leaf rust was actively increasing, but at relatively low levels in plots throughout the state on March 25. There were no reports of rust issues in commercial fields by late March. Leaf rust was still very active in plots of susceptible wheat at Baton Rouge and Winnsboro (northeastern Louisiana) in mid-April. Generally, wheat leaf rust arrived late in the state and caused little damage to commercial fields that matured earlier than is typical.

Mississippi – Low levels of wheat leaf rust were found in edges of a Croplan 8868 field (near boot stage) in northwestern Mississippi in late March. On April 15, low levels of leaf rust were found in a field of Pioneer 26R22 (*Lr11*) at Fearns Spring in Winston County in east central Mississippi. Generally, low levels of leaf rust were found in most wheat producing areas in the state in 2011.

Alabama – Low levels of leaf rust were observed in plots in southern and central Alabama in early May. No rust was found in the northeastern part of the state at that time.

Georgia – Wheat leaf rust was found in early planted plots and had spread to susceptible plots in Plains (west central Georgia) by early March. Low levels of leaf rust were found in susceptible plots by mid-April. No leaf rust was found in surveys of several commercial fields in south central Georgia. Traces of leaf rust were observed in a field in Lee County in southwestern Georgia in late April. Otherwise, no rust was found in commercial fields in several counties surveyed in the southwestern part of the state by late April.

South Carolina – Leaf rust was found in the susceptible plots of USG 3209 (*Lr26,* +) and Panola (*Lr11*) in Barnwell County in the southern coastal plain on April 22.

North Carolina – Wheat leaf rust was very light or absent in commercial fields in late May in eastern North Carolina due to widespread fungicide use. Leaf rust was heavy in susceptible plots in eastern North Carolina on May 20, indicating inoculum was present. Generally, leaf rust was at low levels throughout the state in 2011. However, a late, moderate leaf rust epidemic occurred in Robeson County in south central North Carolina.

Virginia – Traces of wheat leaf rust were found in plots at Warsaw in eastern Virginia on April 14. Wheat leaf rust was very light or absent in commercial fields in eastern Virginia due to widespread fungicide use. Leaf rust was heavy in susceptible plots in eastern Virginia on May 20, indicating inoculum was present.

Delaware, Maryland – Low levels of leaf rust were found on lower leaves in a plot in southern Delaware on May 9. Low levels of leaf rust were found on the eastern shore areas of Delaware and Maryland on May 20.

Arkansas – Heavy amounts of leaf rust were found in a 120-acre field of Jackpot grown for seed in central Arkansas in mid-March. This was the only known leaf rust in the state by March 22. Trace levels of leaf rust were found in plots at Kibler in northwestern Arkansas in early May and by May 18 severities up to 70% were observed on flag leaves in the plots (late soft dough stage). Trace amounts of leaf rust were found on some cultivars (no leaf rust found on most cultivars) in northeastern Arkansas in mid-May. In late May, trace amounts of leaf rust were found in plots at Fayetteville in northwestern Arkansas. Generally, leaf rust was at low levels in the state in 2011.

Missouri – Low levels of leaf rust were found in fields throughout much of the state in early June.

Iowa – Low levels of leaf rust were found in a field at the mealy ripe stage in Wayne County in south central Iowa on June 4.

Kentucky – In early June, leaf rust was widespread on susceptible cultivars (at late grain fill) not treated with fungicide. However, the rust arrived too late to cause any significant yield loss.

Illinois – Low levels of leaf rust were found in a soft red winter wheat nursery (at soft dough stage) in Pope County in southeastern Illinois on June 1.

Indiana – Leaf rust was found throughout the state and was moderately severe on some cultivars in early June.

Wisconsin – Leaf rust was found at trace levels in fields in Dodge and Jefferson Counties in southeastern Wisconsin in early June. Wheat leaf rust severities ranged from 0 to 40% in unsprayed soft red winter wheat plots at the University of Wisconsin Experiment Station at Sturgeon Bay in northeastern Wisconsin on July 8. In unsprayed soft red winter wheat fields (soft dough growth stage) located within 5 miles of the Lake Michigan shoreline from Sturgeon Bay to Manitowoc, 40% leaf rust severities were observed on July 14.

New York – Leaf rust from a suspected overwintering site was found in Cayuga County in north central New York on June 2. Low incidences of leaf rust were found across central, western and southern New York by June 20. Most fields had infections on the upper leaves, but a small number of fields with more severe rust had infections all over the plants typical of overwintering local infections. In western New York, a field of the cultivar Richland was nearly killed by leaf rust and an adjacent field of the cultivar Caledonia had green leaf tissue remaining only on the flag leaves. Low levels of wheat leaf rust were found on various soft red winter wheat lines in mowed alleyways in the nursery at Aurora in central New York in mid-July. Very little rust was found in the plots.

Washington - A few leaves with wheat leaf rust pustules were found in a field in south central Washington in mid-March. A single wheat leaf rust pustule was found on the cultivar Farnum in a field in southeastern Washington on April 15. In 2010, leaf rust was severe on Farnum in the same county.

California - Leaf rust was moderately severe on the cultivar Dirkwin in plots at Colusa in the Sacramento Valley in early April and by late April it was severe in Dirkwin and Mika plots. Leaf rust was found in plots, particularly on the hard white spring cultivar Blanca Grande and some advanced breeding lines, at the UC Davis Agronomy Farm in the Sacramento Valley on May 23. Leaf rust was observed in nurseries in California's Central Valley where normal crop maturity was delayed by cooler and wetter than normal weather.

Ontario, Canada – In early July in southwestern Ontario (Windsor to north of London), leaf rust incidence of 10% and trace to 40% severities were observed on flag leaves of multiple wheat cultivars. The late development of leaf rust was expected to have limited impact on yield.

Wheat leaf rust observation map can be found on the CDL website (http://www.ars.usda.gov/Main/docs.htm?docid=9757).

Special Note: New races of wheat leaf rust with virulence to *Lr21* were detected for first time in North America in 2010. The leaf rust resistance gene *Lr21* was originally derived from the wild wheat relative *Triticum tauschii*. Virulence to this gene had not been detected in isolates of *Puccinia triticina* in North America in previous years. In 2010 in research plots in North Dakota and Minnesota, the wheat cultivars Faller, Glenn, and RB07 with *Lr21* had higher levels of leaf rust than in previous years. Wheat leaf rust races TFBGQ and TFBJQ – both virulent to seedling wheat plants with *Lr21,* were identified in the leaf rust collections from Minnesota and North Dakota. For the complete report, please visit the CDL website.

Wheat cultivar *Lr* gene postulation database. *Please visit*: Leaf rust resistance gene postulations in current U.S. wheat cultivars.

Wheat stripe rust. Generally, wheat stripe rust was widespread and severe in the Pacific Northwest, Sacramento Valley in California and Montana in 2011. Very little stripe rust was found in Texas and Oklahoma, while it was at low levels in Kansas and Nebraska except for scattered hot spots in some fields. Stripe rust was mostly at low levels and widely scattered in the eastern U.S. Stripe rust was active very early in the Pacific Northwest, e.g. mid-February in Washington and Oregon. Conditions there were very conducive for stripe rust development and many areas not treated with fungicides likely experienced yield loss.

Texas - Stripe rust was found in south central Texas plots on March 8, but by mid-April development and spread had ended.

Kansas – Low levels of stripe were found in many locations in the state by late May. By early June, stripe rust could be found in most locations in the state and the levels had increased slightly. However, a few hot spots were found in fields in Ellis (central Kansas) and Smith County (north central Kansas). Susceptible cultivars in an irrigated nursery in Hays had nearly 100% incidence with severities in the range of 5 to 70%. The cultivars with severe disease depended on *Yr17* for resistance. Moderate levels of stripe rust (90% incidence, 10-50% severity) were found in a field in Smith County in north central Kansas in early June. By mid- June, stripe rust was inactive in north central Kansas. Dry conditions in many areas of the state limited stripe rust development in 2011.

Nebraska – A small focus of stripe rust (trace to 35% severity) was found in a commercial field (Feekes 10.5.1) in Polk County in southeastern Nebraska on May 30. Severe levels of stripe rust were found scattered throughout a field in Adams County in south central Nebraska on June 10.

Colorado – Very low levels of stripe rust were found in plots of susceptible cultivars at Fort Collins in north central Colorado on June 13.

Louisiana – Stripe rust was found at very low levels in very susceptible plots at Winnsboro (northeastern Louisiana) on March 3. By late March the stripe rust was very active in the plots. Some lines and several commercial cultivars heavily infected in 2010 were clean in 2011 while some lines and cultivars that were clean in 2010 were susceptible in 2011. This suggests perhaps a population change in the area. By mid-May, stripe rust had developed around the state, but was not a significant problem for growers.

Mississippi – Stripe rust hot spots were detected in a commercial field of Croplan 8868 (near boot stage) in northwestern Mississippi in late March. Much lower levels were detected in a field of Dixie 427 two miles away.

Arkansas – Stripe rust was the most prevalent wheat disease in the state in mid-April, but levels were low due a combination of dry, warm weather, effective resistance in many cultivars and fungicide use. It appears most stripe rust development was restricted to the fields where it overwintered. Rains and cool evenings in late

April were favorable for stripe rust development, but development generally slowed by late May. However, in some areas spore production persisted in late May.

Missouri – Traces of stripe rust were found in many areas of the state in early June.

Kentucky – Low levels of stripe rust were detected in a commercial field of Pioneer 25R35 (Feeke's 6 growth stage) in southwestern Kentucky in late March.

Illinois – Low levels of stripe rust were found in plots in east central Illinois on May 13. Stripe rust was found at very low incidence in plots (near soft dough stage) in Pope County in southeastern Illinois on June 1.

Indiana – Stripe rust was found in a southern Indiana field (Feekes 10.5.3 to 10.5.4 stage) at low incidence and severity the second week of May. Low levels of stripe rust were found in plots and fields in west central and central Indiana, respectively in early June.

California – Cool, wet weather combined with late fall planting of fall-sown spring wheat and barley extended the time of exposure for wheat and barley to stripe in the Central Valley (Sacramento and San Joaquin Valleys) and surrounding areas this year. Above normal rainfall was conducive for stripe rust development. Stripe rust was severe on some plots at heading at Colusa in early March. A commercial field of Joaquin (heading stage) in the same county had severe stripe rust (80% severity, 100% incidence) despite two fungicide applications applied too late for control. A severe natural stripe rust infection developed in the UC Davis Agronomy farm in mid-April where spreader rows had 60-100% severities. Stripe was severe on several cultivars in plots at Grimes and Clarksburg (early dough and anthesis to early dough, respectively) in the Sacramento Valley in late April. Commonly grown hard red wheat Joaquin (reported at 139,000 acres in commercial production) incurred severe levels of stripe rust throughout the area. Relatively few other commercial wheat cultivars were affected.

Washington – Generally, stripe rust was active much earlier in 2011 than 2010 throughout the Pacific Northwest with active sporulation noted in areas in Washington and Oregon in mid-February. Despite the cold weather in late February, stripe rust was active in mid-March in many fields in southeastern and central Washington. In mid-April stripe rust was found at low incidence on lower leaves in winter wheat fields in southeastern Washington. This was the earliest detection of stripe rust in the area in many years. Stripe rust was found in nearly every field checked in Adams and Franklin Counties in central Washington. Incidences ranged from 1 to 10% (except for one field with incidence greater than 30%) and the rust was appearing on some upper leaves. Many fields in central and south central Washington were sprayed with fungicides. Stripe rust severities up to 60% (normal for the area) were found in the Mount Vernon winter nursery in northwestern Washington in late April. Low levels of stripe rust were found in fields in eastern Washington by late April. Fungicide applications had stripe rust under control in many commercial winter wheat fields in southeastern Washington in mid-May. Conditions had been favorable for stripe rust development. Up to 30% of the winter wheat in Garfield County in southeastern Washington was affected by stripe rust by mid-June. Fungicides continued to be applied to control stripe rust. Stripe rust increased rapidly in much of the state, particularly the Palouse region in southeastern Washington by late June. Susceptible winter wheat entries in plots around Pullman (southeastern Washington) had 100% severities, all from natural infection. Due to the extended rust season and extremely high spore load this year fungicide treatment was economical even on resistant cultivars. High-temperature-adult-plant (HTAP) resistance held up, but not to its full extent due to the early season low temperatures and heavy spore load.

Oregon – Stripe rust was widespread in western and northeastern Oregon in mid-April.

Idaho – Stripe rust was found in a row of the hard red winter wheat Moreland in southeastern Idaho in late March. The rust had overwintered, something uncommon in this area. Stripe rust was widely distributed in northern and southern Idaho in mid-April. Stripe rust was increasing on lower leaves in plots at jointing stage at Aberdeen (southeastern Idaho) on May 11. Stripe rust was increasing in commercial winter wheat fields throughout southern Idaho in mid-May. The cool, wet weather was very conducive for stripe rust development and fields not sprayed with fungicides were likely severely impacted. Fungicide applications had stripe rust under control in many commercial winter wheat fields (Feekes 5) in Latah County in northwestern Idaho in mid-May. Unsprayed fields in the county had 10% severity and 40% prevalence. Stripe rust continued to be an issue in northwestern Idaho in mid to late June. Stripe rust development in winter wheat nearly ceased by mid-August, particularly in cultivars with high-temperature adult plant resistance (HTAP). Some spring wheat cultivars were exhibiting higher than expected stripe rust infection (e.g., UI Pettit) while others (e.g., Alturas) were still holding up. Spring wheat fields sprayed with fungicides at herbicide timing had reduced infection compared to unsprayed fields; however, stripe rust redeveloped when a second application was not applied.

Montana – Stripe rust was found in plots and fields in northwestern Montana on May 10. No stripe rust was found in Pondera, Choteau and Teton counties east of the Rockies. In mid-May stripe rust was found at very low incidence on an unknown cultivar in Choteau County. By mid-June, stripe rust was severe in many areas of the state including Hill, Prairie, Big Horn, Lake and Flathead Counties. The resistance in the cultivar Yellowstone was holding up while the reactions on the cultivars Genou and Jagalene varied by location. Stripe rust was very active and severe throughout most wheat producing counties in the state by late June. According to a retired plant pathologist, this is the worst stripe rust he had seen in 30 years. The resistance in the cultivar Yellowstone and AP503 were holding up while the cultivar Genou was very susceptible. Fungicides were applied in many areas of the state. Stripe rust was widely prevalent in both winter and spring wheat in Fergus, Phillips and Valley counties in north central Montana in mid-July. Stripe rust was still active in much of the state despite the high daytime temperatures (90 - 100+ F) in mid-August. Nighttime temperatures ranged from 55 - 70 F with high humidity and significant dews. Stripe rust was widespread and severe in Montana in 2011. Most wheat fields were fungicide sprayed at least once.

Utah – High levels of stripe rust were found in commercial winter wheat fields in Weber and Box Elder Counties in north central Utah the second week of June. Most fields had been treated with fungicides, but some untreated fields were significantly impacted. Some irrigated fields in the Bear River Valley of northern Utah likely experienced yield reductions due to stripe rust. Fungicides were applied by many producers to mitigate the possible damage.

Alberta, Canada – Stripe rust was found at Vulcan in south central Alberta on the winter wheat AC Intrepid (full boot to 50% headed) and the hard white spring wheat Snowstar (6 leaf – 3 tillers) in early July.

Ontario, Canada – Stripe rust was found in a winter wheat nursery at Ridgetown in southwestern Ontario in late June. Incidences ranged from trace to 20% with severities up to 30%.

Wheat stripe rust observation map can be found on the CDL website (http://www.ars.usda.gov/Main/docs.htm?docid=9757).

Oat crown rust. Oat crown rust was found in a plot of Nora in south central Texas the second week in March. By late March, low severities were also found in Walken and HG76-30 plots in the nursery. In irrigated plots in south central Texas crown rust had spread and developed sufficiently in mid-April for rating oat cultivars and lines. Trace amounts of oat crown rust were found in a few plots at Castroville in south central Texas on April 18, but only one early line was heavily infected (>50S). Oat crown rust was found at low levels in a few plots and

scattered on *Avena fatua* in ditches in central Texas in late April. Texas was not a significant source of crown rust inoculum for the Central and Northern Plains this year. The persistent and widespread drought conditions limited the spread and development of oat crown rust in the state.

Oat crown rust was at low levels throughout susceptible plots in Baton Rouge, Louisiana in mid-April, but numerous infections were observed on Brooks borders and spreaders. Frequent heavy dews and high temperatures in late March and early April were conducive for development. A likely trace of oat crown rust was noted in northeastern Alabama in early May. Low levels of oat crown rust were found in plots at Kinston in east central North Carolina the third week of May. Crown rust aecia were found on buckthorn leaves throughout central New York the first week of June.

Aecia were found on common buckthorn (*Rhamnus cathartica*), the alternate host for oat crown rust, in the Matt Moore Buckthorn Plots at St. Paul, Minnesota on May 10. Oat crown rust was increasing and spreading rapidly throughout the nursery in mid-June when early lines were beginning to head. The crown rust continued to increase rapidly in early July with the spreader rows reaching 60-80S. Despite the application of insecticides, barley yellow dwarf virus (BYDV) was found throughout the nursery. Viruliferous aphids likely were feeding on the oats at the seedling stage prior to insecticide application.

Oat stem rust. There were few reports of oat stem rust in 2011. After April reports of oat stem rust in Texas and Louisiana, the next report was not until late June in Illinois followed by reports of low levels in Minnesota and South Dakota and low levels on *Avena fatua* in California.

Oat stem rust was found in a section of the Baton Rouge nursery containing exotic material in mid-April. The rust was fairly prevalent and very active. Oat stem was found in Horizon 270 and Trophy plots at Baton Rouge in southeastern Louisiana on May 5.

Trace amounts of oat stem rust were found in one plot in Castroville in south central Texas on April 18. Heavy stem rust infection was found in a field plot of *Avena strigosa* (black oat) for seed production at Weslaco in extreme southern Rio Grande Valley of Texas on April 20-21. Numerous pustules were found on upper stems and flag leaves in several plots at College Station in southeastern Texas on April 23.

Low levels of oat stem rust were found across southern and west central Minnesota and southern South Dakota in late July. Stem rust was found at trace to low severities on *Avena fatua* in San Francisco, California on August 5 and 6. On August 11, low severities of stem rust were found in hot spots in the foothills of the San Gabriel Mountains at Sierra Madre, California.

Stem rust observation maps can be found on the CDL website (http://www.ars.usda.gov/Main/docs.htm?docid=9757).

Barley stripe rust. Barley stripe rust was found in plots at the UC Davis Agronomy farm in mid-April. Barley stripe rust was severe in several plots at Clarksburg in the Sacramento Valley, California on April 27. By late May, most commercial barley fields in the Central Valley of California had low disease severity despite the cool, wet weather and late fall planting. However, the cultivars Max and Commander and some advanced breeding lines had severe levels of stripe rust in plots throughout the region. Low levels of barley stripe rust were found in the Pullman, Washington nursery in mid June. Barley stripe rust was at very low levels in the Palouse region and was not likely a significant problem in the area.

Barley leaf rust. Dense telia found on dried barley leaves in the Rio Grande Valley of south Texas on April 20-21 suggested barley leaf was severe at the location. Barley leaf rust was severe in a plot at Clarksburg in the

Sacramento Valley, California on April 27. In late May, barley leaf was severe in plots, particularly on the cultivar Commander, in several areas in the Central Valley of California.

Very heavy barley leaf rust infection was found in plots at Blacksburg in south central Virginia while moderate levels were found at Warsaw and Painter in eastern Virginia in early May. Barley leaf rust was found on a few leaves in a nursery in southern Delaware on May 9. High levels of barley leaf rust were found in a few fields on the eastern coast of Virginia and North Carolina the third week in May. Barley leaf rust was found at low levels on winter barley plots at St. Paul, Minnesota on June 20.

Barley stem rust. Stem rust was found scattered on barley used in windbreaks for watermelon fields in the Rio Grande Valley in southern Texas on April 20-21. Stem rust was found on barley lines in plots at Fargo in southeastern North Dakota on August 16. These were the only reports of barley stem rust in 2011.

Rye leaf rust. Rye leaf rust was found on the rye cultivar Elbon in plots in southeastern Texas in mid-April. Heavy leaf rust infection was observed on an unknown winter rye cultivar planted in a mixture with vetch (in rotation with watermelon fields) in the Rio Grande Valley in southern Texas in late April. Rye leaf rust was found in plots in southeastern Minnesota on July 7.

Rust on barberry. Aecial infections, mostly at the pycnial stage of development, were observed on common barberry (*Berberis vulgaris*) in Winona County in southeastern Minnesota and Dane County in south central Wisconsin in late May. Based on past experiences, infections from these locations were mostly due to the rye stem rust pathogen, *Puccinia graminis* f. sp. *secalis*. Early stage of aecial infections on *B. chinensis, B. koreana* and Emerald Carousel (interspecific hybrid), likely by *P. striiformis* f. sp. *poae*, were observed in the vicinity of Twin Cities in late May. Mature aecia were found on *Berberis chinensis*, *B. koreana*, and Emerald Carousel (hybrid) in the Twin Cities area of Minnesota in mid-June. Aecia were also found on ornamental barberry hybrids (Emerald Carousel and Golden Carousel) in Wisconsin. These were likely aecial stage of stripe rust on Kentucky bluegrass (*Poa pratensis*).

In early July, moderate levels of aecial infections were observed on common barberry bushes near Potlatch, in western Idaho. Barberry bush infection in the Palouse region was delayed this year due to the cool spring.

Thank you!

This is the last issue of the Cereal Rust Bulletin for the 2010-2011 small grain-growing season. We would particularly like to thank the following people for their timely observations, comments and collections. Without our cooperators' help, the bulletins and race surveys would simply not be possible.

Cooperator	State	Cooperator	State	Cooperator	State
Kira Bowen	AL	Don Hershman	KY	Brett Carver	OK
Gene Milus	AR	Boyd Padgett	LA	Chris Mundt	OR
Jason Kelley	AR	Stephen Harrison	LA	Don Wysocki	OR
Rick Cartwright	AR	Esteban Falconi	MI	Jim Towne	OR
Scott Monfort	AR	Janet Lewis	MI	Mike Flowers	OR
Dan Marcum	CA	Bob Laudon	MN	Jay Chapin	SC
Jorge Dubcovsky	CA	Brian Steffenson	MN	Karl Glover	SD
Lee Jackson	CA	Jerry Ochocki	MN	Lon Hall	SD
Zewdie Abate	CA	Jim Anderson	MN	Amir Ibrahim	TX
Scott Haley	CO	Jochum Wiersma	MN	Bob Duncan	TX
Bob Mulrooney	DE	Lucy Wanschura	MN	Bryan Simoneaux	TX
Alfredo Martinez	GA	Marty Carson	MN	Jackie Rudd	TX
Dan Bland	GA	Matt Rouse	MN	Jason Baker	TX
James Buck	GA	Roger Caspers	MN	John Goolsby	TX
Jerry Johnson	GA	Ruth Dill-Macky	MN	Rex Herrington	TX
John Roberts	GA	Sam Gale	MN	Robert Duncan	TX
John Youmans	GA	David Tague	MO	Russell Sutton	TX
Jianli Chen	ID	Tom Allen	MS	James Barnhill	UT
Juliet Marshall	ID	Mary Burrows	MT	Andrew Green	VA
Maria Newcomb	ID	Christina Cowger	NC	Carl Griffey	VA
Mike Bonman	ID	Greg Endres	ND	Kent Evans	WA
Carl Bradley	IL	Marcia McMullen	ND	Xianming Chen	WA
Fred Kolb	IL	Maricelis Acevedo	ND	Adrian Barta	WI
Herb Ohm	IN	Janelle Millhouse	NE	Alan Roelfs	WI
Kiersten Wise	IN	Stephen Baenziger	NE	AlanRoelfs	WI
Sam Brown	IN	Stephen Wegulo	NE	David Long	WI
Bob Bowden	KS	Gary Bergstrom	NY	Gordon Cisar	WI
Doug Jardien	KS	K Severson	NY		
Doug Shoup	KS	K Witkop	NY	Courtney Stephenson	Alberta, Canada
Erick De Wolf	KS	Art Klatt	OK	Albert Tenuta	Ontario, Canada
Dave Van Sanford	KY	Bob Hunger	OK		