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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 generally appeared late in the season and at low levels.
- Wheat leaf rust was widely distributed, but generally at low levels in 2013.
- The distribution of wheat stripe rust was greater than last year, but was generally less severe than in 2012.
- There were very few reports of oat stem rust in 2013.
- *Thanks to those who contributed rust observations, collections, etc. in 2013!*

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

Wheat stem rust. Wheat stem rust appeared late in the crop season from Mississippi north to North Dakota west to Colorado and east to New York and was also found in the Palouse region of the Pacific Northwest (see wheat stem rust observation map). Generally, the stem rust was found at low levels and did not cause significant losses. The highest severities were found in plots in southeastern Nebraska (20-80%), southeastern South Dakota (80%) and a field in south central North Dakota.

Mississippi
A few pustules of wheat stem rust were found on the stems and heads of three winter wheat plants in a plot in Hinds County in west central Mississippi in late May.

Arkansas
Two stem rust foci were found in plots at harvest time, but stem rust was not found in commercial fields in the state.

Oklahoma
Wheat stem rust was found on a single stem of the cultivar Winterhawk in plots in Alfalfa County in north central Oklahoma on June 5. Stem rust was found in nearly mature plots near Stillwater in north central Oklahoma on June 18. It appeared as though the severity reached 50% or higher.

Kansas
Low levels of wheat stem rust were found in plots at Hutchinson in south central Kanas on June 14.

Nebraska
Stem rust from light to moderate severity and light to high prevalence was observed on several lines and cultivars in plots at Goehner in southeastern Nebraska on July 5. The plants were at Feekes growth stage 11.

Colorado
A wheat stem rust focus was observed in a nursery in Berthoud in north central Colorado in early July. Persistent drought conditions were not conducive for rust development.

Missouri
Trace amounts of wheat stem rust were found on two cultivars in plots in Pettis County in central Missouri and on volunteer wheat in a wheat field in Scott County in southeastern Missouri on June 7.

Wisconsin
Very low levels of wheat stem rust were found in winter wheat plots at Janesville in south central Wisconsin on June 20. The stem rust was localized to several plots. Wheat was at milk to early dough growth stages.

Ohio
In a rust survey conducted from Wisconsin through northeastern Missouri, Illinois, Indiana and Ohio, stem rust was only found in three fields in western and northwestern Ohio on June 27. The stem rust was found on plants that had not yet matured.

Michigan
Two small stem rust foci were found in soft white winter wheat plots at Mason in central Michigan on July 1.

South Dakota
Low levels of stem rust were found in plots in Brookings and Aurora in eastern South Dakota in late June. Stem rust reached damaging levels on the winter wheat Robidoux and a few other susceptible cultivars in plots. Stem rust was not found on spring wheat.

North Dakota
Wheat stem rust was found at trace levels in plots of susceptible cultivars in north central and northeastern North Dakota in late July. Stem rust was also found on one cultivar, Robidoux, in trials at Napoleon in south central North Dakota.

Minnesota
Wheat stem rust was found at trace levels in plots of susceptible cultivars in northwestern Minnesota in late July.

Washington
Wheat stem rust was found in the Palouse region the second week of August. Stem rust severities of up to 20% were found in winter wheat plots near Pullman, Washington. In a spring wheat plot stem rust was found at 5% incidence and 20% severity. Stem rust was at much lower levels than in 2012.

To date, race QFCSC, the predominantly identified race in recent years, is the only race identified from collections made in 2013. Race QFCSC has been identified from collections received from Oklahoma, Kansas, Nebraska and Ohio. Final stem rust survey results will be available on the CDL website in the Fall of 2013.

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

Wheat leaf rust. Wheat leaf rust was widely distributed across the U.S. from the Great Plains to the east coast (see wheat leaf rust observation map), but was generally found at low levels. Cool spring weather in the Great Plains and eastern states delayed small grain development, planting and field work. In late May, wheat leaf rust was at atypically low levels for that time of year, particularly in the southern and central Great Plains. Inoculum levels from Texas into the central and northern Great Plains were low due to cooler spring temperatures, dry conditions and the application of fungicides.

The leaf rust races with virulence to *Lr21* are now well established in the Great Plains, as these races were found in plots of Faller and Glenn wheat in Castroville, Texas in 2013.

Texas
Wheat leaf rust severity was high in plots (up to 80S) at Pearsall and uniform in the lower canopy of plots at Uvalde in south Texas in early February. Leaf rust continued to develop at Uvalde and susceptible cultivars at Feekes 4-5 growth stage had high leaf rust severity by late February. Leaf rust was at trace levels and was uniformly distributed through the spreader rows in plots at Castroville in south central Texas in early February and continued to develop in the spreader rows and lower to mid-canopy of the cultivar TAM 110 reaching 50S in early March. By mid-April, high levels of leaf rust were observed in plots at Castroville. Generally, leaf rust was at low levels in commercial fields in the state due to cool spring temperatures, dry conditions and the application of fungicides.

Oklahoma
Low levels of wheat leaf rust were found on the winter wheat cultivar Overley (boot to head emergence) near Devol in south central Oklahoma the second week of April. This was the first cereal rust report in Oklahoma in 2013. No leaf rust was found in plots and fields (at boot stage) in central Oklahoma on April 26. By the second week of May there appeared to be very little wheat leaf rust in the state. Leaf rust was found in plots at Perkins (5-20S) and Stillwater in north central Oklahoma the fourth week of May. Drought and late season freezes severely impacted wheat production in the panhandle in 2013. Trace amounts of wheat leaf rust were found in north central Oklahoma on June 5. Generally, wheat leaf was at atypically low levels in the state in 2013.

Kansas
A single wheat leaf rust pustule was found in Stafford County in south central Kansas the second week of May. This was the only report of wheat leaf rust in in the state by the second week of May. Wheat in southwestern Kansas suffered from drought and freeze damage while wheat in south central and central Kansas was in better condition due to some much needed rain. By late May, there were only a few reports of wheat leaf rust in state. Trace amounts of wheat leaf rust were found in susceptible plots of Winterhawk in Saline County in central Kansas. On May 31, trace amounts of wheat leaf rust were found in plots in Reno County in south central Kansas. Trace amounts of wheat leaf rust were found in fields in south central Kansas and plots in north central and northeastern Kansas in early June. Susceptible cultivars such as Overley (*Lr39/41*), Jagger (*Lr17*), Jackpot (*Lr39/41*) and Fuller (*Lr17*, *Lr39/41*) had higher severities, but incidence was low. Trace amounts of leaf were observed on the cultivars Everest (*Lr1*, *Lr14*a), Armour (*Lr39/41*) and Cedar. No rust was reported in Ellis, Rush, Ness, Lane and Russell Counties in central and west central Kanas where the wheat was in very poor condition due to drought.

Nebraska
Wheat leaf rust had not yet been reported in the state by May 30. A hot spot of wheat leaf rust was found in plots at Lincoln in southeastern Nebraska on June 7. The lower leaves had 40% rust severity and higher while the flag leaves had only trace amounts. Wheat in the plots was at flowering to milk stage. This was the first report of wheat leaf rust in the state in 2013. Wheat leaf rust development increased rapidly in mid-late June in winter wheat plots and surrounding fields at Mead and Lincoln in southeastern Nebraska. Flag leaves of susceptible lines had high severities and the rust was widespread in the fields. Leaf rust was also observed in fields in south central Nebraska where wheat was mostly in dough growth stages.

Iowa
Trace amounts of wheat leaf rust were reported in a field in Lee County in extreme southeastern Iowa on June 8.

Louisiana
Low levels of wheat leaf rust were found in plots at Baton Rouge in southeastern Louisiana in early March. High levels of leaf rust were found in plots in south central and southwestern Louisiana on April 2. Rains and morning

dews in late March created conditions conducive for further development. Wheat leaf rust was found in variety and fungicide tests around the state in 2013.

Mississippi
Low levels of leaf rust were found in three counties in the Delta area in late March. Leaf rust was confirmed in six counties scattered across the state by mid-April and by May 20 leaf rust had been found in 10 counties across the state.

Arkansas
Low levels of leaf rust were found in plots at Kibler in northwestern Arkansas on May 17. The first report of wheat leaf rust in the state was at low levels in plots at Rohwer in southeastern Arkansas on May 10. Generally, wheat leaf rust appeared just before crop maturity and caused little damage.

Missouri
Wheat leaf rust was found in plots in Johnson, Pettis and Boone Counties in west central and central Missouri in early June. Severities ranged from trace to 20% and incidence from trace up to 40%. Trace levels were also found in fields in Lincoln and Marion Counties in northeastern Missouri.

Georgia
Wheat leaf rust was at very low levels in the state in 2013, likely due to the widespread use of fungicides to control stripe rust.

North Carolina
Leaf rust disease pressure was moderately severe in the Kinston and Plymouth plots in eastern North Carolina in 2013. The leaf rust arrived early in the plots and severely attacked the Saluda (*Lr11*) border rows. Other lines and cultivars in the plots were not as severely impacted as Saluda. Leaf rust was also found in plots at Clayton and Lake Wheeler in east central North Carolina**.** Many commercial fields were sprayed with fungicides to reduce leaf rust losses. Wheat leaf rust was generally at low levels in commercial wheat fields, below average levels for the state.

Virginia
Low levels of leaf rust were found in plots at Painter in eastern Virginia in mid-May. Relatively higher incidences were found on susceptible cultivars such as Massey as well as cultivars with *Lr9*. Lower leaf rust incidence was found on cultivars with *Lr24* and much lower incidence on cultivars with *Lr26*. No rusts were found on visits to the plots at Blackstone (southern Virginia) and Holland (northeastern Virginia) in mid-May. Wheat leaf rust was found in plots at Blacksburg in western Virginia in late May. Leaf rust was severe on susceptible lines in plots at Warsaw in eastern Virginia on June 11. A few weeks earlier only trace amounts of wheat leaf rust were found in the plots.

South Dakota
Very low levels of leaf rust were found in fields in Douglas and Buffalo County in central and south central South Dakota, respectively, in late June. On July 10, low levels of leaf rust were found in a winter wheat field in Clark County in northeastern South Dakota. Leaf rust was readily found in the southern half of the state at levels from trace to 40 percent infection in research plots in early July, however, it was difficult to find in commercial fields possibly due to fungicide applications. Wheat ranged form soft dough to dough stage. Wheat leaf rust was difficult to find in northern South Dakota even in research plots. It appeared many of the fields were treated with fungicides. Generally, leaf rust was found at trace levels in fields with some fields having moderate levels.

North Dakota
Trace amounts of wheat leaf rust were found in Baart-Wolfe spreader rows and spring wheat entries in nurseries at Carrington in east central North Dakota on July 11. Low levels of wheat leaf rust were found on lower leaves in plots at Casselton in eastern North Dakota on July 16. There was some flecking on flag leaves. Wheat leaf rust development increased in plots of Decade and other susceptible cultivars in plots maintained by Ducks Unlimited in the Dakotas by mid-July. High levels of infection were noted at Napoleon in south central North Dakota. Wheat leaf rust was present at low levels in plots in central North Dakota and at trace levels in north central North Dakota in late July. Plots of Faller wheat in northwestern North Dakota had large uredinia although at low severity. The leaf rust races with virulence to *Lr21* are now well established in the Great Plains, as these races were also found in plots of Faller and Glenn wheat in Castroville, Texas earlier in 2013. In northeastern North Dakota wheat leaf rust was present at trace levels in plots of susceptible wheat cultivars.

Minnesota
Trace levels of wheat leaf rust were found in winter wheat plots in southeastern Minnesota on June 14. The infections were highly localized and not distributed throughout the plots**.** A single pustule of wheat leaf rust was found on a hard red winter wheat line in a nursery in northwestern Minnesota on June 26. Low levels of wheat leaf rust were found on Baart in plots at Lamberton in southwestern Minnesota in early July. Wheat leaf rust was present at moderate to high levels in plots in west central Minnesota the last week of July. Trace levels of leaf rust were found in wheat fields in the same area that had been sprayed with fungicide. In northwestern Minnesota, wheat leaf rust was present at trace levels in plots of susceptible wheat cultivars.

Wisconsin
Very low levels of wheat leaf rust were found on winter wheat in plots at Janesville in south central Wisconsin on June 20. Wheat leaf rust was widespread in soft red winter wheat plots at Arlington in south central Wisconsin in early July. Flag leaf severities ranged from 10-50%. Wheat was at dough stage. Low levels of wheat leaf rust were found in fields in eastern and northeastern Wisconsin in early July.

Michigan
Wheat leaf rust was found in plots at Mason in central Michigan in mid-June**.** High levels of wheat leaf rust were found in Sanilac County in the thumb region of Michigan in early July. Leaf rust was likely present throughout the state by early July.

Ohio, Indiana, Illinois
Wheat leaf rust at low levels was readily found in winter wheat fields across the northern halves of these states in late June. One field in Shelby County in west central Ohio had higher leaf rust severities. Wheat was generally at hard dough stage.

New York
The first report of wheat leaf rust in the state was made at Brockport in northwestern New York on June 5. The rust was found on a single leaf of an unknown cultivar in a commercial field. The wheat was a number of days past flowering and rainy, cool conditions continued in the area. Low levels of wheat leaf rust were observed on winter wheat in central and western New York the fourth week of June.

Washington
Wheat leaf rust was found at lower than typical levels in plots at Mt. Vernon in northwestern Washington, but was not found in eastern Washington and northern Idaho in 2013.

Ontario, Canada
Trace amounts of wheat leaf rust were found in winter wheat plots at Ridgetown in southwestern Ontario (about an hour east of Detroit) on June 21.

Wheat leaf rust races identified to date from 2013 collections.

Virulence code	Virulences	State	No. of isolates
MBDSB	1,3,17,B,10,14a	TX	1
MBDSD	1,3,17,B,10,14a,41	TX	3
MBPSB	1,3,3ka,17,30,B,10,14a	TX	5
MBPSD	1,3,3ka,17,30,B,10,14a,41	TX	1
MBTNB	1,3,3ka,11,17,30,B,14a	LA, MS	15
MCTNB	1,3,26,3ka,11,17,30,B,14a	AL, LA, MS, TX	10
MDPSB	1,3,24,3ka,17,30,B,10,14a	TX	2
MFNSB	1,3,24,26,3ka,17,B,10,14a	TX	2
MFPSB	1,3,24,26,3ka,17,30,B,10,14a	TX	8
MLDSD	1,3,9,17,B,10,14a,41	TX	2
MMPSD	1,3,9,26,3ka,17,30,B,10,14a,41	TX	1
PBDGJ	1,2c,3,17,10,28,41	TX	2
PCDGJ	1,2c,3,26,17,10,28,41	TX	2
SBDG	1,2a,2c,17,10,	TX	1
SBDGG	1,2a,2c,17,10,28	MS	1
TBBGJ	1,2a,2c,3,10,28,41	TX	1
TBBGS	1,2a,2c,3,10,21,28,41	TX	1
TBBJG	1,2a,2c,3,10,14a,28	LA, MS	2
TBRKG	1,2a,2c,3,3ka,11,30,10,14a,18,28	AL, LA, MS	7
TCRKG	1,2a,2c,3,26,3ka,11,30,10,14a,18,28	AL, AR	5
TCTSB	1,2a,2c,3,26,3ka,11,17,30,B,10,14a	LA	2
TDBJG	1,2a,2c,3,24,10,14a,28	TX	1
TDBJQ	1,2a,2c,3,24,10,14a,21,28	TX	3
TFPJB	1,2a,2c,3,24,26,3ka,17,30,10,14a	TX	1
TNBGJ	1,2a,2c,3,9,24,10,28,41	TX	2
TNBJJ	1,2a,2c,3,9,24,10,14a,28,41	AL, TX	7
Total			88

Wheat leaf rust 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.

Wheat stripe rust. The distribution of stripe rust exceeded last year's record distribution in the U.S., however, stripe rust was generally not as severe as last year in most locations. Dry spring conditions in the Pacific Northwest along with widespread use of fungicides limited stripe rust development there this year. Widespread, significant rain in late June in the Pacific Northwest created more optimum conditions for stripe rust, however, hot weather and reduced inoculum hindered further development. Stripe rust was more severe in Louisiana, Mississippi, Georgia and Arkansas, but damage was generally mitigated by the application of fungicides.

Texas
Trace amounts of wheat stripe rust were found in plots at College Station in southeastern Texas in early February and by late February stripe rust had reached 20S and 60S on two early-planted increase strips (jointing to heading). Stripe rust (20S) was found on TAM 110 at Uvalde in early February and continued to develop in late February. Lines with *Yr17* showed no stripe rust infection. At Castroville in southern Texas, stripe rust continued to develop in the lower to mid canopy of the spreader rows and an unknown head row had a 100S reaction. By mid-April, stripe rust development was winding down in plots at Castroville due to increasing temperatures.

Oklahoma
Reports of stripe rust in Oklahoma were common in late April. One field near Apache in south central Oklahoma had low levels of stripe rust across the field. Stripe rust was present on lower-mid leaves and most severe on the cultivar Duster in plots at Minco in central Oklahoma. Stripe rust was also found around Stillwater, but it was not severe. No rusts were found at Kingfisher (30 miles northwest of Stillwater). Reports of stripe rust increased in the state the second week of May, but there was no indication of a widespread or severe outbreak anywhere in the state. The fourth week of May, wheat stripe rust was found at low incidence and severity in plots at Lahoma and Stillwater in north central Oklahoma. The wheat was at fully berry to milk stage. Trace amounts of wheat stripe rust were found in north central Oklahoma on June 5. Generally, wheat stripe rust was found at low incidence and severity in the state in 2013.

Kansas
Very low levels of stripe rust were found in commercial fields in southeastern Nebraska in mid-May and there was no significant development due to rising temperatures. No rust was found in a late May survey of five counties in north central Kansas. Wheat in the area was flowering or just past flowering. By early June**,** trace amounts of wheat stripe rust were found in fields in south central Kansas and trace to low levels were found in plots in north central and northeastern Kansas. The stripe rust was found the cultivars Everest, Winterhawk, TAM 111 and Armour. Stripe rust generally did not developed to any extent in the state in 2013, likely due to the higher temperatures.

Nebraska
Stripe rust was observed on wheat at the 3-4 leaf stage in plots at Mead in eastern Nebraska on May 7. The affected plots had incidence in excess of 70% and severity ranged from trace to moderate. Typically, stripe rust is not seen on plants at such an early growth stage in Nebraska. As with many areas east of the Rockies, wheat development was very delayed, up to three weeks in Nebraska. This was the first report of stripe rust in Nebraska in 2013. Development of the stripe rust at Mead had stopped following high temperatures the week of May 13, however, the rust increased to higher than trace levels by late May. Rains around this time created conditions conducive for rust infection and development in eastern Nebraska. No rust was found during a survey of three counties in southeastern Nebraska on May 21 and 22.

Stripe rust at low incidence and trace to moderate severity was observed in the Nebraska Panhandle on June 25. In plots at Sidney, in the southern Panhandle, stripe rust was easy to find and hot spots with severities ranging from trace to 35% were found. Rains in the area favored stripe rust development. Similar severities and hot spots were found in a dryland field in the northern Panhandle that appeared stressed from lack of moisture. Wheat in the Panhandle was in the early to late dough growth stages. Significant additional stripe rust development did not occur in the Panhandle due to higher summer temperatures and lack of continuous moisture in this area. Stripe rust incidence in plots at Mead and Lincoln in southeastern Nebraska remained generally low, but there were some hot spots at Mead by June 20. Warm temperatures slowed stripe rust development in the hot spots. Stripe rust was also found in fields in Clay and Nuckolls Counties in south central Nebraska. Wheat was mostly in dough growth stages.

Colorado
A few stripe rust pustules were observed in the state, but extremely dry conditions were not conducive for rust development.

Louisiana
Wheat stripe rust was found in several fields by late February and was fairly common in northern Louisiana by early March. Some stripe rust was found in plots at Baton Rouge in southeastern Louisiana in early March. High levels of wheat stripe rust were found in plots in south central and southwestern Louisiana on April 2. The rust was actively developing and rains and morning dews created conditions conducive for further development. Stripe rust was rapidly spreading in plots at Baton Rouge in early April. Stripe rust was active and developing in fields in central Louisiana the first week of April.

Mississippi
Wheat stripe rust was found in two fields in Leflore County in west central Mississippi on February 25. One field was a field of Armor Ricochet (Feekes 6-7) while the other was Coker 9553 (Feekes 7). By late March stripe rust was found throughout the Mississippi Delta area in the northwestern part of the state. Several fields in Leflore County had large hot spots of stripe rust and one field in Bolivar County had severe stripe rust.

By March 30, wheat stripe rust was found in 9 counties in the Delta area of the state and one county in south central Mississippi and the rust was severe at some locations. Rains and moderate temperatures were conducive for further development. Isolated stripe rust hot spots were found throughout Mississippi in mid-April and stripe rust was confirmed in 16 counties. Some fields in the mid-Delta were severely infected, but generally the stripe rust was not as severe as it was in 2012.

Alabama
Stripe rust was observed in plots near Tallassee in east central Alabama the second week of May. Several cultivars had trace amounts of stripe rust while two cultivars had 10-50% severity on the upper two leaves.

Arkansas
Wheat stripe rust was observed on an unknown cultivar in at least four hot spots in a field in northern Lonoke County on December 19, 2012. This was about one month earlier than the earliest stripe rust observation on record for the state that was set last year. It was believed the hot spots likely developed throughout Arkansas and perhaps surrounding states. Two of eleven fields surveyed in eastern Arkansas the third week of March had multiple hot spots that had already begun to spread while the other fields showed no sign of stripe rust. At Rowher in southeastern Arkansas, stripe rust was widespread in a field of Ricochet. In plots at Rowher, stripe was prevalent on Ricochet, Beretta, Progeny 185, and Arcadia and also found on Coker 9553, Harrison, Progeny 308, Terral 8661, and 26R20.

Stripe rust was reported numerous times in eastern Arkansas this year and the levels were much higher than those reported in 2012. This can be largely attributed to the cool, wet weather this year. The rust was most frequently reported on two widely grown cultivars, Richocet and Beretta which both have some adult plant resistance to stripe rust. Stripe rust was heavy on a line in plots at Bay in northeastern Arkansas on April 4. The flag leaves were just emerging. Stripe rust was still active in the state the second week of May and was still active in plots at Kibler in northwestern Arkansas on May 17. Early fungicide application and adult plant resistance to stripe rust limited losses in the state.

Missouri
Stripe rust at trace to 60% severity and 25% prevalence was found in plots in Johnson County in west central Missouri in early June while trace levels of stripe rust were found in plots in Boone County in central Missouri. Trace levels of stripe rust were found in fields in Scott and Lincoln Counties, in southeastern and east central Missouri, respectively,

in early June. Twenty to forty percent severity and 10% incidence were observed in Marion County in northeastern Missouri.

Georgia – Stripe rust was first observed in the southwestern part of the state and spread rapidly through the wheat growing areas of the state. High levels of stripe rust were observed in commercial fields in southwestern and central Georgia in early to mid-March. An unusually cool, wet spring created conditions conducive for stripe rust development. Fungicides were applied to control stripe rust throughout the state.

South Carolina
Low levels of stripe rust were found on winter wheat at early boot near Ashton in south central South Carolina on April 9.

North Carolina
Stripe rust was severe this year in plots in Clayton in central North Carolina while traces were found on a few plants at Kinston in eastern North Carolina. Low levels of stripe rust were found in plots at Plymouth in eastern North Carolina in late May. Wheat stripe rust foci were found scattered throughout the state, but development was generally limited.

Tennessee – Stripe rust was found in 9 counties in western Tennessee at varying levels of incidence and severity by earl May. Fungicides were applied to commercial fields.

Kentucky
Low levels of stripe rust were detected in a field in Christian County in southwestern Kentucky by early May.

Virginia
Trace amounts of stripe rust were found in a few headrows in plots at Warsaw in late May. A single stripe rust lesion was found on one leaf in a plot of the cultivar SS 520 at Blackstone in southern Virginia in mid-May. Wheat stripe rust (~1% prevalence) was found only in a few plots at Painter in eastern Virginia in mid-May. The cultivar Tribute had a few plants with severity ranging from 1-40%. Stripe rust in plots at Blacksburg in western Virginia had increased to 90% severity on highly susceptible lines by mid-June.

Illinois
Stripe rust at low incidences was observed in two commercial fields in Champaign County in east central Illinois the second week of May. The wheat was at or near boot stage. Stripe rust at low incidence and severity was observed in White County in southeastern Illinois while no rust was found in Pope, Saline and Gallatin Counties when visited this week. Wheat in southeastern Illinois was flowering. Stripe rust at low incidence and severity was observed in Madison (southwestern Illinois) and Fayette (south central Illinois) counties the fourth week of May. There was no new development or spread of stripe rust previously reported in Champaign County in east central Illinois.

Ohio – Wheat stripe rust was found in a winter wheat field in Logan County in west central Ohio in late June**.**

Michigan
Wheat stripe was observed on susceptible soft winter wheat plots in Allegan (western Michigan), Ingham (central Michigan) and Lenawee (southern Michigan) Counties the week of June 9. The plants were one to two weeks past early flowering. Severities up to 50% were observed on a few leaves (flag and #2 leaf) of the cultivar Red Ruby in Allegan County. Stripe rust was not found in plots in eastern Michigan. Low levels of stripe rust were found on the cultivar Hopewell in Sanilac County in the thumb region of Michigan and in Presque Isle County in the far northern lower peninsula in early July. It appears stripe rust was widespread in the state, but at lower incidence and severity than in 2012.

Delaware
Low levels of stripe rust were found in commercial winter wheat fields in eastern Kent County on May 14. The wheat in the area was flowering or near flowering. There were no reports of rust in Newcastle or Sussex County.

New York
Stripe rust was reported in a commercial field of the soft red winter wheat Emmit in Hamlin in northwestern New York on June 20. This was the first report of stripe rust in the state in 2013. Stripe rust was found in winter wheat plots at Ithaca in south central New York in late June.

Vermont
Wheat stripe rust was found in plots at Alburgh in northwestern Vermont in late June. This was the first year stripe rust samples from Vermont were received by the ARS stripe rust group at Pullman, Washington.

South Dakota
Trace levels of stripe rust were found in a field in Buffalo County in central South Dakota in late June. Stripe rust (~20% severity) was also observed in four fields between Chamberlain and Platte in south central South Dakota. Stripe rust was also found in one field in Tripp County in south central South Dakota. Wheat in central and south central South Dakota was at heading to milk growth stages. On July 10, low levels of stripe rust were found in a winter wheat field in Clark County in northeastern South Dakota.

Wisconsin
Wheat stripe rust was found at 25-50% incidence and 20-50% severity in some plots at Janesville in south central Wisconsin on June 11. The previous week stripe rust could only be found at trace levels. Wheat had flowered or was in full flower. By June 20, the stripe rust in the plots had increased to 100% incidence and 75% severity on susceptible winter wheat cultivars. Wheat was at milk or early dough stage. Trace levels of stripe rust were found in winter wheat fields in northeastern Wisconsin in early July. Dry conditions in the area slowed the rust development and hastened crop maturity.

California
Several stripe rust hot spots (severity up to 30%) were found in a commercial field of an unknown cultivar in Yolo County in late March. Stripe rust was also found on wild barley in Yolo County. Stripe rust appeared later this season than in past years. By early May, stripe rust was established in plots in the Central Valley even though the disease was late in developing in 2013. High stripe rust severities were observed on previously susceptible cultivars and lines, those that expressed resistance in 2012 were not affected. Some commercial fields of the susceptible cultivar Joaquin had high stripe rust severities in Kings and Tulare Counties in the San Joaquin Valley, particularly when the fields were not treated with fungicides.

Pacific Northwest
Wheat stripe rust was generally at very low levels on winter and spring wheat in Oregon and Washington in late June. Widespread use of fungicides and very dry conditions earlier in the season greatly reduced the rust inoculum. Rains in late June and favorable temperatures created favorable conditions for stripe rust development, but hot weather followed and slowed further stripe rust development. Many fields did not require a second fungicide application.

Oregon
Wheat stripe rust was developing rapidly in plots in the South Willamette Valley on April 24. Wheat stripe rust was easily found on winter wheat cultivars and lines in plots at Hermiston in northeastern Oregon in early May. Resistant to moderately resistant reactions were observed in triticale plots.

Washington
Winter wheat fields (Feekes 3-6) in eastern Washington were scouted on April 3. Wheat stripe rust was easily found and actively sporulating on lower leaves in fields in Adams and Lincoln counties in southeastern Washington. Stripe rust was also found in Franklin County, but at lower incidences than the fields in Adams and Lincoln counties. No stripe rust was found in Benton and Whitman counties. In late March, stripe rust had developed up to 20% incidence and 50% severity in susceptible winter wheat spreader rows in nurseries near Walla Walla in southeastern Washington. Stripe rust had developed to 70% severity and 100% incidence in susceptible winter wheat spreader rows in nurseries at Mount Vernon in northwestern Washington.

Generally, low levels of wheat stripe rust were observed in commercial winter wheat fields in Franklin, Columbia, Garfield and Whitman counties in southeastern Washington in early May. Susceptible winter wheat check plots in Walla Walla County had developed up to 60% severity and 80% incidence. Stripe rust developed up to 80% severity on susceptible winter wheat lines at Mt. Vernon in northwestern Washington while low levels of stripe rust with mostly resistant reactions were found in commercial fields in the area. In a survey of the Palouse region of southeastern Washington on May 23 stripe rust was easy to find in plots near Pullman, but only one pustule was found in commercial fields in the area. The rust in the plots had moved from the lower leaves up into the middle and upper canopy with incidences ranging from 1 -10%. Winter wheat in the area ranged from jointing to heading. No rust was found in spring wheat fields. Spring wheat ranged from emerged to jointing stages. Susceptible checks in plots at Pullman eventually reached 100% severity, the damage was relatively high on winter wheat compared to spring wheat. Most winter wheat fields in central and southeastern Washington were treated with fungicides. This, in combination with dry conditions, high temperatures and early fungicide applications limited stripe rust infections and development.

Idaho
The first report of stripe in Idaho this year was from the Hazelton area in south central Idaho. The well-developed rust was found on the soft white winter wheat Brundage on May 22 and had possibly overwintered. By early June, wheat stripe rust had been reported on the susceptible soft white winter wheat cultivars Brundage and WB 470 and others in south central and some southeastern counties of Idaho as well as in plots of Brundage at Moscow in northwestern Idaho. The stripe in the southern areas was found in small hot spots, however, large amounts of inoculum were present and the stripe rust was spreading. Wheat stripe rust continued to develop on the soft white wheat cultivar Brundage and other susceptible winter wheat cultivars throughout southern and eastern Idaho in mid-June.

Montana
Stripe rust was first observed east of the Rockies in north central Montana on June 3 on the cultivar Genou. Stripe rust was widespread on winter wheat in Montana and was moving into susceptible spring wheat cultivars by early July. High levels of stripe were observed in susceptible plots and a field of the cultivar Decade in Pondera County in northwestern Montana. Resistance in the winter wheat cultivar Yellowstone was still holding up well.

Ontario, Canada
High levels of stripe rust (100% incidence up to 30% severity) were observed on the soft read winter wheat cultivar Brooklyn in plots at Ridgetown in southwestern Ontario (about an hour east of Detroit) on June 21.

Wheat stripe rust map. *Please visit:* (http://www.ars.usda.gov/Main/docs.htm?docid=9757).

Oat stem rust. There were few reports of oat stem rust in 2013. It was reported in plots in Louisiana, Texas and South Dakota; a field in Indiana and on wild oat in a spring wheat field in South Dakota and in northwestern Minnesota.

Oat stem rust (50% severity, 40% prevalence) was first found on an oat line (heading stage) in a nursery at College Station in southern Texas on February 25. Oat stem rust was next reported in plots at Baton Rouge in southeastern Louisiana on April 4. There were no additional reports until late June when oat stem was only found in one field in Tippecanoe County in west central Indiana in a multi-state survey of the Ohio Valley. On July 10, oat stem rust was found on wild oat growing in a spring wheat field in Brookings County in eastern South Dakota. On the same day very low levels were found in plots at Beresford in southeastern South Dakota. Oat stem rust was found in a field south of Volga in eastern South Dakota on July 26. Oat stem rust was found in northwestern Minnesota in early August.

Race TJS was identified from collections made in late February in southern Texas plots and plots in southeastern South Dakota in early July.

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

Oat crown rust. Oat crown rust was heavy in plots at Marianna and easy to find in plots at Qunicy in the Florida panhandle in early February. Some cultivars showed good resistance, the plants were not yet jointed. The oat crown was very earlier and more severe than in many years. None of the currently released oat cultivars appeared to be resistant to the 2013 oat crown rust population in Florida. Light levels of oat crown rust were found in the Baton Rouge, Louisiana nursery in early March. Oat crown rust was found in one field in Jackson County in southeastern Mississippi in late March. High levels of oat crown rust (80% severity, 80% prevalence) were found in plots (Feekes 8-10) at Garwood in southeastern Texas in late March. Crown rust was found in oat fields in a few counties in Georgia from southwestern to east central Georgia in late April, but was mostly concentrated in the south central part of the state.

Aeciospores were being released from aceia on common buckthorn (*Rhamnus cathartica*), the alternate host for oat crown rus, in the Matt Moore Buckthorn Nursery at St. Paul in southeastern Minnesota on June 13. Crown rust infections had not yet shown up on oat in the nursery. Oat crown rust was developing at the buckthorn nursery in St. Paul, Minnesota by late June. Buckthorn plants and inoculated spreader rows displayed high severities of oat crown rust and the disease was developing in the entry rows and hill plots by late June.

Oat crown rust was only found in one field in Tippecanoe County in west central Indiana in a multi-state survey of the Ohio Valley in late June. A few pustules of oat crown rust were found in plots at Ithaca in south central New York in early July and there were no reports of oat crown rust in commercial fields in the state.

Low to moderate levels of oat crown rust were found in fields and plots in the southern half of South Dakota in early July. The oat plants were at milk to soft dough stages. No crown rust was observed in northern South Dakota in early July. Oat crown rust was found in northwestern Minnesota in early August.

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

Barley stem rust. Low levels of stem rust were observed in mature barley plots in southeastern Nebraska in early July. The rust arrived late and did not appear to significantly impact yield. High levels of stem rust were found on foxtail barley, *Hordeum jubatum*, in plots in eastern South Dakota in early July.

Barley leaf rust. Barley leaf rust was found in plots at Warsaw in eastern Virginia on January 10 and the rust was active in plots in early May. Barley leaf rust was common in the lower canopy of susceptible border rows in plots at Blacksburg in western Virginia on April 29. In mid-May, barley leaf rust at ~80% prevalence and up to 90% severity was found in plots at Painter in eastern Virginia.

Low levels of barley leaf rust were found in a winter barley field at Appleton in northwestern New York in late May. The barley heads were just emerging. Trace levels of barley leaf rust were found in plots of winter barley at Aurora in central

New York on June 7. By the fourth week of June, low levels of barley leaf rust were found on winter barley in plots and fields in Cayuga, Livingston, Monroe, and Tompkins Counties central and western New York.

Barley leaf rust was widespread in winter barley plots at Mount Vernon in northwestern Washington in early June. Some barley entries had severities greater than 90%. Barley leaf rust was also observed in plots at Corvallis, Oregon. Barley leaf rust has never been observed east of the Cascade Mountains in the Pacific Northwest.

On July 29, barley leaf rust at 100% incidence and 25% severity was observed in a barley field near Almena in northwestern Wisconsin. Barley leaf rust was found in a barley field in northwestern Minnesota in early August.

Barley leaf rust map. *Please visit:* (http://www.ars.usda.gov/Main/docs.htm?docid=9757).

Barley crown rust. Trace levels of barley crown rust were observed on the barley cultivar Aim at the early boot stage in the buckthorn nursery at St. Paul, Minnesota in late June.

Stripe rust on barley. In early May, barley stripe rust was severe in plots of the highly susceptible cultivar Max in Fresno County in the San Joaquin Valley of California. Generally, barley stripe rust was at very low levels throughout the Pacific Northwest with the exception of western Oregon. Barley stripe rust levels in northwestern Washington were the lowest since the disease first appeared there in 1995. Barley stripe rust was observed in Arizona, California, Oregon, Idaho and Washington in 2013.

Barley stripe rust severities up to 40% were observed in winter barley plots at Mt. Vernon in northwestern Washington in early May. On May 23, barley stripe rust was found on one leaf in a winter barley plot near Pullman in southeastern Washington. The widespread use of fungicides and dry weather earlier in the season greatly reduced rust inoculum.

Stem rust on Einkorn. Stem rust was reported as severe on *T. monoccum* (Einkorn) at Feekes 10.5 growth stage in a plot at Davis, California on May 6. The rust on the Einkorn was identified as the rye stem rust pathogen, *Puccinia graminis* f. sp. *secalis*.

Rye leaf rust. Rye leaf rust was found in Tomkins County, New York in late June. This was the first report of rye leaf rust in the U.S. in 2013. In early July, rye leaf rust was found in southern South Dakota.

Rust on other grasses. Stripe rust was found on wild barley in Yolo County, California in late March. Crown rust was found on Italian ryegrass at Crowder in Quitman County and Belzoni in Humphreys County in northwestern Mississippi in early May. In 2012, crown rust was widespread in Mississippi on Italian ryegrass. Low levels of leaf and stripe rust were found on *Aegilops cylindrica* in a nursery in Lincoln County in central Kansas in early June. Low levels of stem and stripe rust were found on *Lolium* sp. (possibly *L. multiflorum*) in Scott County in southeastern Missouri in early June. In last week of July, severe stem rust was observed in plots of perennial ryegrass (*Lolium perenne*) in St. Paul.

Rust on barberry. Light amounts of early aecial infections were observed on common barberry (*Berberis vulgaris*) in southeastern Minnesota and south central Wisconsin in late May. In late June, light amounts of aecial infection were found on common barberry (*Berberis vulgaris*) in eastern Wisconsin. Low levels of aecia were observed on barberry near Potlach in northwestern Idaho and Colfax in southeastern Washington in late June. No stem rust was found in the spring barley fields (at heading stage) surrounding the bushes near Potlach. Any stem rust that develops will be at a relatively low level compared to 2012. Light amounts of aecial infections on common barberry were found in New Hampshire in mid-June.

Rust on buckthorn. Aeciospores were being released from aecia on common buckthorn (*Rhamnus cathartica*), the alternate host for crown rust, *Puccinia coronata*, in the Matt Moore Buckthorn Nursery at St. Paul in southeastern Minnesota the second week of June. Typically, oat straw with telia are placed on the bushes in the nursery to promote infection, however, the telia straw was not available this year and the infection on the bushes was all from natural infection. Due to the cool spring development in the nursery was delayed about two weeks later than average. Oat crown rust was developing in the buckthorn nursery at St. Paul, Minnesota by late June. Crown rust aecia were also found on common buckthorn in central New York in late May and in southeastern Minnesota and northwestern Wisconsin in early June.

Thank you!

This is the final Cereal Rust Bulletin for 2013. 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.

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Kira Bowen	AL	Sam Stoxen	MN	Roger Gribble	OK
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Our sincere apologies if by oversight we did not include someone in the list.