

Issued by:

Cereal Disease Laboratory

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This is the final Cereal Rust Bulletin that I will write. After 40 years of working at the Cereal Disease Lab, I will be retiring in December. I would like to thank **everyone** who has ever contributed to the Cereal Rust Bulletin's success. I have enjoyed working at the CDL. If you are ever in Door County, Wisconsin, please look me up.

Take care,

David Long (david.long@ars.usda.gov)

- Wheat stem rust was at low levels in plots and fields of susceptible winter and spring wheat.
- Wheat leaf rust was widespread and at low to moderate levels throughout the U.S.
- Wheat stripe rust was at the most severe level since 2005 with significant losses in Kansas.
- Oat stem rust levels were low throughout the U.S.
- Oat crown rust levels were more severe than recent years in the northern oat growing area.
- Barley stem rust was at low levels in the northern plains and Pacific Northwest.
- Barley leaf rust was more widespread and more severe than normal in the U.S.
- Stripe rust on barley was at more severe levels than in previous years in the western U.S.
- Rye leaf rust was at moderate levels in north central U.S. fields.
- Aecia were found on susceptible barberry in Idaho, Minnesota, Washington and Wisconsin.

Wheat Stem Rust. Texas – The first report of wheat stem rust in 2010 was of low levels of stem rust found in plots at Weslaco near the Mexican border on March 18. Low levels of wheat stem rust were found on flag leaves and stems in McNair 701 disease detection plots in irrigated nurseries at Uvalde and Castroville in south Texas on April 8 and 14, respectively.

On May 7, high levels of wheat stem rust were found in a McNair 701 disease detection plot at Yoakum in south Texas. In mid-May, low levels of stem rust were found in a plot of the stem rust susceptible cultivar McNair 701 at McGregor in central Texas. In mid-June, a significant amount of stem rust was observed on the susceptible varieties Winterhawk, Bill Brown, HG9, Winmaster and Weathermaster 135 in the irrigated



nursery at Bushland in the panhandle of Texas. The wheat was mature and drying down and harvest had begun in the area.

Oklahoma - In early June, low levels of stem rust were found on the stems of breeder lines in a plot planted later than normal at Lahoma in north central Oklahoma.

Kansas - In early June, low levels of stem rust were found in plots at two locations in Kansas: Manhattan in the northeast and Pratt in the south central.

Nebraska – On June 23, wheat stem rust was found on triticales planted as a border around the scab nursery at Mead and in two susceptible lines in the Lincoln nursery. In late June, low levels of stem rust were found in the winter wheat variety Winterhawk in western Nebraska plots.

South Dakota – In mid-June, stem rust was observed at trace-low levels in winter wheat plots at Brookings. In late June, low levels of stem rust were found in the winter wheat variety Radiant at Brookings, Highmore, Pierre and Watertown experiment stations in central and east central South Dakota. In mid-July, low levels of stem rust were found in winter wheat variety plots at the Watertown experiment station in east central South Dakota.

North Dakota – On June 29, stem rust was observed for the first time in 2010 in North Dakota on Yellowstone winter wheat at the Casselton seed farm. Incidence was 50% severity and was 5% on the flag leaves with only a very few pustules on the stems. In late July, stem rust was present in plots of the susceptible spring wheat cultivar Baart in central North Dakota.

Minnesota – On June 18, traces of stem rust were found in a winter wheat plot at the Rosemount Experiment Station in southern Minnesota. On June 28, low levels of wheat stem rust were found on the susceptible trap spring wheat variety Baart in Waseca and Lambertson plots in southern Minnesota. Many of the infections were observed on the flag leaf or on the stem area just below the flag leaf. In mid-July, low levels of stem rust were found in susceptible spring wheat lines at the Rosemount Experiment Station. In late July, wheat stem rust was present in plots of the susceptible cultivars Baart and Max in northwestern Minnesota and in a plot of Baart in west central Minnesota. On July 23, high levels of stem rust were found on triticales growing in a mixture of field peas and clover planted as cover crop for forage production in west central Minnesota.

Wisconsin – In early July, low levels of stem rust were found in soft red winter wheat plots in Oconto and Door County fields in northeastern Wisconsin.

In summary, during the months of June and July, low levels of wheat stem rust were found in susceptible winter wheat and spring wheat plots from northeastern Wisconsin through Minnesota to central North Dakota. Stem rust was not observed on any current wheat cultivars in research plots or in fields in this area.



Missouri – In mid-July, low levels of stem rust were found on soft red winter wheat cultivars in plots throughout the state from Barton County in the southwest to Knox County in the northeast.

Louisiana - On April 28, low levels of stem rust were found in Crowley plots in southern Louisiana. The crop matured rapidly so rust development was limited. On May 5, a stem rust infection center that ranged in severity from trace to 20% was found in a plot at Winnsboro in northeastern Louisiana. Last year, in the same plots, plants with moderate to high infection levels were scattered throughout the nursery. The stem rust infections are lower this year due to a cooler than normal early spring and low amounts of rainfall in March and April.

Mississippi – In mid-May, severe levels of stem rust were found in plots of late-maturing soft red winter wheat at Greenville in west central Mississippi.

Kentucky – In late May, stem rust was observed in a nursery plot at Princeton in western Kentucky.

Idaho – On June 28, stem rust was found at low levels in a winter wheat field located near barberry bushes in northwestern Idaho.

In 2010, stem rust was only found in susceptible winter and spring wheat cultivars growing in plots in the U.S. Stem rust observation maps can be found on the CDL website (<http://www.ars.usda.gov/Main/docs.htm?docid=9757>).

Preliminary race identifications - From collections made from the above locations east of Rocky Mountains, race QFCSC was identified as the predominant race. This is a common race that has been found in the U.S. the past several years. This race is relatively avirulent - the majority of the U.S. cultivars are resistant to QFCSC. Race-identification is in progress for samples collected from Washington and Idaho. Complex virulence types are expected from this region.

Aecial infections on barberry (alternate host for stem and stripe rust). In late April, low levels of pycnial infections were found on susceptible common barberry (*Berberis vulgaris*) bushes growing in south central Wisconsin. In mid-May in Wisconsin, aecial infection levels of susceptible barberry bushes in Dane and Manitowoc Counties were low, while bushes in Ozaukee County were heavily infected with rust. In early June, moderate levels of aecial infections were found on the common barberry in Manitowoc County (east central Wisconsin) and light infections on bushes in Marquette County in central Wisconsin.

In early May, low levels of aecial infections were found on common barberry bushes in southeastern Minnesota. In early June, moderate levels of aecial infections were found on bushes in southeastern Minnesota.

Aecial infections on barberry in Minnesota and Wisconsin were of rye stem rust pathogen (*Puccinia graminis* f. sp. *secalis*) only. Pathogens of wheat stem rust (*P. graminis* f. sp.



tritici) or oat stem rust (*P. graminis* f. sp. *avenae*) were not isolated in these aecial samples.

In mid-May, aecial infections were observed on the common susceptible barberry bushes in Latah County, Idaho and Whitman County in Washington. The bushes in Latah County were heavily infected, almost every leaf was infected with multiple rust pustules, which was similar to last year. The rust samples collected from barberry bushes in May in Latah County, Idaho and Whitman County, Washington were identified as a mixture of wheat and rye stem rusts. In early June, no stem rust was found in the spring wheat field surrounding the bushes in Latah County, but volunteer plants of winter wheat and barley grown in the spring wheat field were heavily infected by stem rust. Light amounts of stem rust infections were observed in a nearby winter wheat field, about 500 yards from the barberry bushes.

Timothy Stem Rust – In mid-July, stem rust was found on timothy (*Phleum pratense*) in southeast Minnesota and northwest Wisconsin.

Wheat Leaf Rust. Texas – In early February, low levels of leaf rust were found in southern Texas. By late March low to moderate levels of leaf rust were found throughout the state of Texas. The most severe leaf rust was found in the Jagger (*Lr17* resistance), Jagalene (*Lr24*) and TAM 112 (*Lr41*) cultivars. The above normal winter rainfall throughout much of Texas enhanced rust development. In early April, leaf rust was increasing on susceptible cultivars in southern and central Texas plots. Only low levels were observed in fields throughout Texas. In mid-April, leaf rust was increasing (>90% severity) on susceptible cultivars (Jagalene, TAM 110, Fuller, etc.) growing in plots in southern and central Texas.

In early May, leaf rust was increasing on the susceptible cultivars Jagalene (*Lr24*), TAM 110, and Fuller (*Lr17*, *Lr39/41*) in central and northern Texas plots (Fig. 1). Moderate levels of infection were found in central and northern Texas fields.

Oklahoma – In mid-February, leaf rust was at trace to low levels in northern Oklahoma plots. On March 24, foliar diseases were minimal on wheat in the state. In early April, low levels of leaf rust were observed in Oklahoma. In mid-April, leaf rust was increasing on susceptible cultivars in central Oklahoma plots at Stillwater. In early-planted Jagalene, 25-40% severities were reported. In late April in some areas of southwestern Oklahoma, leaf rust was increasing in incidence and severity. In areas where leaf rust was severe, the cultivars Jagalene, Jagger (*Lr17*) and Overley (*Lr39/41*) had leaf rust severities from 40-60% on the F-1 or lower leaves.

Kansas – In early March, low levels of wheat leaf rust that overwintered were found in research plots near Manhattan in northeast Kansas. By late March, leaf rust was increasing slowly in Kansas. On April 9, low levels of leaf rust were found in wheat plots in south central Kansas. In mid-April, leaf rust was at low levels on Jagalene in central Kansas.

In early May, leaf rust was reported at several locations in the central part of Kansas. In



south central Kansas it was found on the flag leaves of susceptible varieties. In early June, severe leaf rust was observed in fields of susceptible varieties (Overley, Jagger, Jagalene) throughout eastern and central Kansas. Leaf rust was also noted on Armour, Fuller and PostRock, which had been highly resistant in recent years. In 2010, a 1% loss due to leaf rust was estimated compared to a 3.8% twenty-year average. Leaf rust remains the most important disease to Kansas yields over time (Preliminary 2010 Kansas Wheat Disease Loss Estimates).

Nebraska - On April 26, low levels of leaf rust were found in Nuckolls County in south central Nebraska. This is one of the earliest dates leaf rust has been found in Nebraska in recent years. In mid-June, leaf rust was increasing in southern Nebraska. During the last week in June leaf rust levels were high in susceptible winter wheat varieties in western Nebraska plots. Fields in the same area had low levels of infections.

South Dakota – In early June, leaf rust was observed at trace-low levels in winter wheat plots at Brookings. During the last week in June, leaf rust levels were high in susceptible winter wheat varieties in central and eastern South Dakota plots while low levels were observed in fields. In early July, trace levels of leaf rust were observed in eastern South Dakota spring wheat fields. In mid-July, moderate levels of leaf rust were observed in northeastern South Dakota fields and plots.

North Dakota – On June 17, low levels of leaf rust were found in winter wheat plots in Sargent County in southeast North Dakota. This was the first report of leaf rust in North Dakota in 2010. In late June, low levels of leaf rust were found in winter wheat and trace levels of infection were found in spring wheat in North Dakota. In late July, spring wheat was maturing rapidly in central North Dakota. Moderate levels of leaf rust were present on susceptible or moderately susceptible cultivars. Resistant cultivars had trace to low levels of rust. Leaf rust was observed in different cultivars with *Lr21* at different locations.

Montana – On July 7, low levels of leaf rust were found in the dryland winter wheat variety plots at the Southern Ag Research Station at Huntley.

Minnesota – On May 21, trace levels of leaf rust were found in a plot of the susceptible winter wheat “old-timer” Cheyenne at Rosemount in east central Minnesota. In early June, trace levels of leaf rust were found in soft and hard red winter wheat plots in southern Minnesota. Infections were widely scattered on the lower wheat leaves in the plots. In early June, low levels of leaf rust were found on winter wheat plots at Lamberton in southwestern Minnesota. In mid-June, high levels of leaf rust were found in susceptible winter wheat plots in southern Minnesota while low levels were found in winter wheat plots in west central Minnesota.

In late June, high levels of leaf rust were found on the susceptible spring wheat Baart in southern Minnesota plots while low levels were observed in plots of Baart in west central Minnesota. In mid-July, high levels of leaf rust (40-60%) were observed on susceptible cultivars in the spring wheat nursery at the Rosemount Experiment Station in east central



Minnesota. In late July, moderate levels of leaf rust were found in plots of susceptible spring wheat in west central Minnesota.

Wisconsin - In mid-June, high levels of leaf rust were observed in soft red winter wheat plots while low levels were found in fields in southern Wisconsin. In late June, low levels of infection were observed in fields and light to moderate levels were observed in plots in eastern Wisconsin.

Louisiana – In early April, low levels of leaf rust were found in wheat plots and fields in southern Louisiana. In late April, moderate levels of leaf rust were found on susceptible wheat in southern Louisiana plots. In early May, leaf rust levels were severe in northeast Louisiana plots and low in fields. In mid-May, leaf rust levels were moderate in northeast Louisiana fields. Hot temperatures slowed the rust development in much of this area.

Arkansas – In early May, traces of leaf rust were found in plots at Fayetteville in northwestern Arkansas. In mid-May, leaf rust had increased on susceptible varieties in plots and in northeastern Arkansas while low levels were found in fields in the same area.

Georgia - In late April, low levels of leaf rust were found in wheat plots at Plains in southwest Georgia. In mid-May, low levels of leaf rust were observed in fields while severe levels were found on susceptible varieties in plots in southwestern Georgia.

Alabama – In early May, moderate levels of leaf rust were found on susceptible wheat in southern Alabama plots.

Kentucky – In mid-May, leaf rust was widespread in western Kentucky fields on susceptible varieties. Weather conditions were conducive for widespread infection and symptom development. Many of the fields were sprayed with fungicide. This was the most leaf rust observed in this area in several years.

Illinois – During the third week in May, low levels of leaf rust were found in research plots in Fayette and Champaign Counties. In late May, moderate levels of rust were found in soft red winter wheat fields in southern Illinois. In mid-June, moderate levels of leaf rust were observed in fields of susceptible varieties in southern Illinois. Most of the wheat was near maturity.

Indiana– By early June, leaf rust incidence and severity had increased in fields and plots throughout Indiana. Severity in most fields and research plots was low, but in some plots leaf rust severity approached 20% on the flag leaf.

Ohio – In mid-June, wheat at the soft dough growth stage had leaf rust severity of 20% in west central Ohio fields.

North Carolina - In mid-April, leaf rust was occurring earlier than usual on the susceptible winter wheat check cultivar Saluda in plots at the Cunningham Research station in Kinston.



Virginia – In late April, leaf rust was found on the susceptible varieties Red May and Massey at Warsaw in east central Virginia plots. In early May, trace amounts of leaf rust were found on the varieties Massey (*Lr1*, *Lr14a*) and McCormick (*Lr24*) at heading stage in the nursery at Blacksburg in southwestern Virginia. In early May, the susceptible varieties Massey and Sisson (*Lr26*) had high levels of leaf rust infection in plots at Warsaw. In mid-May, traces of leaf rust were observed on Massey at Blackstone while severe levels were found on the cultivars USG 3209 (*Lr26*) and Sisson at Holland in southeastern Virginia. During the third week in May, leaf rust was severe in plots of susceptible cultivars at Painter on the eastern shore. Wheat leaf rust continued to increase at Warsaw on cultivars that were not highly resistant. In late May, severe levels of leaf rust were observed on susceptible cultivars in plots at Blacksburg in western Virginia.

Maryland – On April 28, low levels of leaf rust were found on the lower wheat leaves in a nursery at Salisbury in southeastern Maryland.

Delaware – During the third week in May, low levels of leaf rust were found throughout the canopy of several cultivars in the Delaware variety trial plots in Sussex County. One cultivar was heavily infected where the flag leaf infection ranged from 10-30%.

New York – In mid-May, trace levels of leaf rust were distributed across a 100-acre field at different canopy height levels in Genesee County in western New York. This was a fairly early detection date for New York, but not unprecedented. In late May, a 20-foot diameter severe rust foci was found in a field in north central New York. The rust likely overwintered at this location. In mid-June, wheat fields had leaf rust severities of trace to 10% on the flag leaf throughout the state. In early July, high levels of leaf rust were observed on the Heritage Variety Red Fife in a plot at Ithaca.

Pacific Northwest - On April 29, one pustule of leaf rust was found in an early-planted winter wheat field in southeastern Washington. In mid-June, winter wheat fields had 1-40% leaf rust severities in Franklin County in southeastern Washington. Leaf rust losses were limited since the crop was near maturity. In early July, low levels of wheat leaf rust were found in the winter wheat plots in southeastern Washington and moderate wheat leaf rust was found in south central Washington fields.

Canada – In early June, low levels of leaf rust were reported in the Clinton and Staffa areas of southwestern Ontario. In early June, trace levels of leaf rust were reported on the hard red spring wheat variety AC Domain in southern Manitoba, near the city of Winkler. This was very early to find leaf rust at this location. In mid-June, low levels of leaf rust were found throughout southwestern Ontario and leaf rust was found in Southern Manitoba on spring wheat.

Preliminary race identifications - From rust collections made in November and April in Texas, the following leaf rust races were identified: MFPSB (*Lr17*, *Lr24*, *Lr26*) and MLDSB (*Lr9*, *Lr17*, *Lr39/41*). From a collection made in early March in a nursery near Manhattan, Kansas the TDBGG (*Lr24*) race was identified. From collections made in southern Louisiana in early April the following races were identified: TCRKG (*Lr11*,



Lr18, Lr26), TBRKG (*Lr11, Lr18*) and MLSD (*Lr9, Lr17, Lr39/41*). From collections made in early May, in Virginia, the following races were: MCTSD (*Lr17, Lr26, Lr39/41*), TBRKG (*Lr11, Lr18*) and TCRKG (*Lr11, Lr18, Lr26*). These leaf rust races represent some of the most common races identified from rust collections made during the 2009 leaf rust survey. (For more detailed information see: [Race Surveys](#) on CDL website).

Wheat cultivar *Lr* gene postulation database. Please visit: [Leaf rust resistance gene postulation in current U.S. wheat cultivars](#).

Wheat Stripe Rust. Texas – In late February, wheat stripe rust levels were severe and extensive throughout the College Station nursery. By late March, low to moderate levels of stripe rust were found throughout the state. Some of the more severe levels of stripe rust were observed on cultivars Jagger, Jagalene and other cultivars derived from these. In the past, the *Yr17* stripe rust resistance (Jagger) has been very effective, but the latest reports indicate that new races with virulence to this gene may be present. These are the highest stripe rust levels reported in Texas since 2005. In early April, stripe rust levels were severe in plots in southern and central Texas. The cool nights and light dews in the morning were conducive for stripe rust development. In late April, wheat stripe rust was present throughout Texas except for the Panhandle. The winter and spring were cooler and wetter than normal, allowing stripe rust to develop extensively in Texas in 2010 (Fig. 2).

Oklahoma – In early April, the only report of stripe rust in Oklahoma was on the lower leaves of the wheat cultivar Jagalene growing in border rows at Stillwater. In mid-April, stripe rust was increasing in plots and fields of cultivars with *Yr17* stripe rust resistance. Spraying for foliar diseases was recommended. In early May, stripe rust levels were severe on the varieties Jagalene and Jagger (*Yr17*) throughout much of the wheat growing areas of Oklahoma. In the varietal nurseries stripe rust levels were lower on many of the commonly grown varieties. During the third week in May, wheat across southern and central Oklahoma had lost or was quickly losing flag leaves from a combination of diseases and maturation.

Kansas - The first report of stripe rust in Kansas was on April 20 in plots at Belleville in north central Kansas. The rust was found on the cultivars Jagalene, Jagger and Santa Fe. In late April, low levels of stripe rust were found throughout central Kansas. On May 3, trace levels of stripe were found at Colby in northwest Kansas. During the third week in May, stripe rust was increasing throughout central and eastern Kansas. Stripe rust could easily be found on the flag leaves in most fields. The incidence of disease on the upper leaves ranged from trace to more than 20 percent and severity generally was less than 10%. Stripe rust caused severe yield losses in northern Kansas and many growers attempted to reduce potential losses with fungicides. In late May, stripe rust was a major concern to the farmers in the state. The severity of stripe rust increased dramatically during the last two weeks of May and many fields had 20-40% severity on the flag leaves. In early June, the hot temperatures had slowed the development of stripe rust in Kansas and spore production decreased. In 2010, a 10.3% loss to stripe rust was reported in Kansas. This represented 76% of the wheat disease loss statewide and was equal to the largest stripe rust loss since 1976 when estimates began. The districts with the most



losses were west central and northwest Kansas with losses greater than 16 percent overall and over 30 % on susceptible varieties (Preliminary 2010 Kansas Wheat Disease Loss Estimates).

Colorado - In mid-May, low levels of stripe rust were found in eastern Colorado. Good moisture conditions and moderate temperatures promoted continued rust development in this area.

Nebraska – In late April, low levels of stripe rust were found in a Johnson County field and in early May high levels of stripe rust were found in a Jefferson County field in southeastern Nebraska. By the third week in May stripe rust was widespread in south central and southeast Nebraska. Incidence and severity ranged from trace to nearly 100% depending on the field. Stripe rust was found in the southern Panhandle area in late May. In early June, stripe rust severities ranged from trace to 100% in localized areas in a field in Dawes County in the extreme northwest. In mid-June, the predominant wheat disease in southern Nebraska was stripe rust and losses were significant in some fields. Stripe rust severity levels were high (greater than 70%) in susceptible varieties and breeding lines. By the last week in June, wheat stripe rust development was slowed by the hot weather and dry conditions in western Nebraska.

South Dakota - In mid-May, low levels of stripe rust were found in a south central South Dakota field. In mid-June, low levels of stripe rust were found in plots at Brookings in eastern South Dakota and increasing slowly in some fields in western South Dakota. On June 25, stripe rust levels were low throughout South Dakota and by early July hot weather had stopped wheat stripe rust development.

North Dakota – In mid-June, wheat stripe rust was reported at low levels in winter and spring wheat in southern and northeastern North Dakota. In late June, high levels of stripe rust were found in winter wheat plots in southern North Dakota. On June 24 low levels of stripe rust were found in a few spring wheats at the Carrington extension center in central North Dakota. In late July, stripe rust was found in wheat plots in central North Dakota. The cultivar Faller was most affected by stripe rust.

Montana – By late June, low levels of stripe rust were found throughout much of the state.

Minnesota – In mid June, low levels of stripe rust were observed in winter wheat plots in east central Minnesota. In late June, low levels of stripe rust were observed in a field in northwestern Minnesota and in west central Minnesota plots. In early July, hot weather slowed wheat stripe rust development.

Wisconsin – During the third week in May, trace levels of stripe rust were found in a Dodge County field in southeastern Wisconsin. In late June, low to moderate levels of stripe rust were found in soft red winter wheat fields in northeastern Wisconsin.

Louisiana –In early March, stripe rust foci were found in several wheat plots at Baton Rouge. In mid- March stripe rust was widespread but not severe throughout the state. In



early April, wheat stripe rust was widespread throughout the state. In southern Louisiana nurseries 60% rust severities were reported on susceptible cultivars. The cool nights and light morning dews were conducive for stripe rust development. In mid-April, wheat stripe rust was widespread throughout the state. Many fields were sprayed to control the disease. In late April, stripe rust development had slowed considerably in Louisiana because of dry conditions that limited further stripe rust infection.

Arkansas – The first report of stripe rust in Arkansas in 2010 was in the southwest corner of the state near Texarkana in late March. In early April, wheat stripe rust was widespread in Arkansas south of I-40, but mostly at low levels. Moisture and cool temperatures were conducive for rust development throughout the state. On April 23 in northwestern Arkansas plots located at Kibler and Paris, stripe rust was severe in several cultivars, but the commonly grown cultivars such as Beretta, Magnolia, and Coker 9553 were still resistant. Cool nights and light morning dews were conducive for stripe rust development. By early May in the Arkansas River Valley, stripe rust had moved out from the hot spots and was uniformly distributed throughout the susceptible varieties. Overall, varieties suspected of having *Yr17* seemed to be moderately susceptible. Many of the commonly grown varieties are still resistant and appear to have adult-plant resistance. Nighttime temperatures were still favorable for stripe rust, but moisture was limited in the Delta and Grand Prairie regions of eastern Arkansas where most of the wheat is grown.

End-of-season rust situation: March and April generally were favorable for wheat and unfavorable for diseases. The one exception was stripe rust on susceptible varieties in some areas of the Arkansas River Valley and Southwest Arkansas. Delta wheat growing regions were not impacted by stripe rust most likely because the rust did not overwinter in this region and stripe rust could not get an early start when conditions were favorable.

Mississippi – On April 7, low levels of stripe rust were detected in wheat variety trial plots in Stoneville. In early May, trace levels were found in plots at the Raymond. Experiment station.

Alabama – In early May, no wheat stripe rust was observed in southern Alabama plots.

Kentucky - In mid-May, stripe rust was widespread in western Kentucky fields on susceptible varieties. Weather conditions were conducive for widespread infection and symptom development. Many of the fields were sprayed with fungicide.

Illinois – The first report of stripe rust in Illinois in 2010 was on May 4 when low levels of stripe rust were found in a winter wheat field in Randolph County in southwestern Illinois. During the third week in May, stripe rust was reported at a high incidence in a field located in St. Clair County in southwestern Illinois. Stripe rust was also observed at low incidences in University of Illinois research plots located in Fayette County (south central) and Champaign County (east central).

Indiana – In early June, low levels of stripe rust were observed in several fields in southwest Indiana and in research plots in north central Indiana. Research plots in



southern Indiana had 20-50% severities on the flag leaf of the variety Candace.

Virginia – On April 29, stripe rust was found at Mt. Holly in east central Virginia. On May 21, trace levels of stripe rust were found in yield plots at Warsaw.

Maryland – In early May, severe levels of stripe rust infection were found in two infection foci in Dorchester County in southeastern Maryland. During the third week in May, severe levels of stripe rust were found on the flag leaves of wheat in the Clarksville plots at the anthesis growth stage.

Delaware – During the third week in May, several stripe rust foci were observed on several cultivars in the Delaware variety trial plots in Sussex County.

California – Stripe rust was reported in nurseries in California in late March. In mid-April, 30 to 90% severities of stripe rust were reported on the common susceptible cultivars Anza, Yecora Rojo, Express and Summit in the regional wheat test sites throughout California.

Pacific Northwest. Oregon – Stripe rust foci first were observed in March and subsequently the rust spread throughout the Willamette Valley of Oregon. The predominant winter wheat variety Goetze was heavily infected with stripe rust. Many fields were sprayed. In late April, traces of stripe rust were found in wheat nurseries at the Hermiston experiment station in northern Oregon. During the third week in May, stripe rust was reported at the Pendleton experiment station in northeastern Oregon.

Washington - In mid-March severe levels of wheat stripe were found on susceptible checks in experimental fields in the Mount Vernon area of northwestern Washington. In mid-April, stripe rust reached 80% severity on susceptible entries in winter wheat nurseries at Mt. Vernon in western Washington, which was slightly higher than last year at the same location. In wheat fields, stripe rust infection was common and many fields had been sprayed with fungicides. As of mid-April no stripe rust had been found in eastern Washington. In late April, low levels of stripe rust were found in eastern Washington fields. The lower than normal temperatures in April slowed wheat growth and stripe rust development.

During the second week in June, stripe rust was widespread in winter wheat fields in southeastern Washington. Most of the fields had severities below 10% and 20% incidence. Stripe rust was found in spring wheat fields at low incidence and severity (2%). By mid-June, stripe rust was found throughout most areas of the Pacific Northwest. Fungicides were applied for stripe rust control in the winter and spring wheat crop. A highly susceptible crop of either winter or spring wheat easily could have yield loss of more than 60%. Head infection by stripe rust is common this year. Damage by head infection is relatively low compared to leaf infection. Head infection is more common this year than previous past years due to favorable weather conditions and heavy inoculum.

Idaho - Wheat stripe rust appeared very late this year in southern Idaho plots and fields.



During the second week in June, stripe rust was widespread in winter wheat fields in Latah County. Most of the fields had severities below 10% and 20% incidence. In early July, stripe rust was found in both winter and spring wheat in southern Idaho. In mid-July, high levels of stripe rust were found in spring wheat fields in Bingham County in eastern Idaho. The cool nights and warm days were conducive for stripe rust increase. In late July, light levels of stripe rust were found in plots at Aberdeen.

In summary, stripe rust did cause significant damage on the winter and spring wheat crop in some regions of the Pacific Northwest.

Canada - In mid-June, wheat stripe rust was reported on winter wheat at Woodstock in Ontario and on spring wheat in southern Manitoba, Canada.

In 2010, wheat stripe rust infections in the southern U.S. were more severe and extensive than last year due to more initial inoculum sources of infection, lower than normal temperatures in early spring and plentiful moisture for rust development. For example, cool and moist conditions were predominate in Kansas during the spring growing season and consequently there was a large loss (10.3%). As the season progressed day and nighttime temperatures continued to increase and conditions for stripe rust development were less favorable leading to a reduced amount of stripe rust inoculum for the northern wheat growing regions of the U.S.

Oat Stem Rust - On April 7, several large pustules of oat stem rust were found in plots at Baton Rouge, Louisiana. In late April, oat stem rust was increasing in plots at Baton Rouge, Louisiana. On May 4, a stem rust overwintering site (.5 m in diameter) was found on oat at soft dough growth stage at Fairhope plots in southern Alabama.

On April 11, traces of stem rust were found on the upper leaves and stems of oat in plots at College Station in central Texas. Weather conditions were conducive for increase of stem rust in this nursery. In early May, severe stem rust was found in plots while traces were found in fields in central Texas. The next report of oat stem rust was on July 9, when low levels of oat stem rust were observed in a plot at Rosemount, Minnesota. In mid-July, low levels of oat stem rust were found in spring oat plots and fields in southern Minnesota and eastern South Dakota. Oat stem rust observation maps and identified races can be found on the CDL website:

<http://www.ars.usda.gov/Main/docs.htm?docid=9757>).

Oat Crown Rust. In late March, traces of crown rust were found on oat in central and southern Texas. In early April, oat crown rust levels were low and increasing slowly on the susceptible cultivars Nora and Brooks at College Station, Texas. In late April, oat crown rust levels were severe on the susceptible cultivars in southern Texas plots. In mid-April, crown rust infections were less than normal in southern Louisiana plots. Rust infections were low because of cooler and drier than normal conditions in March and early April.

In early May, oat crown rust levels were low throughout central Texas and southern Oklahoma. In mid-May, crown rust infections were increasing in Louisiana plots.



In early June, severe levels of crown rust were observed on the lower leaves in oat spreader rows in the St. Paul, Minnesota buckthorn nursery. In mid-June, oat crown rust levels were low in fields and plots in southern Wisconsin and eastern South Dakota plots. In late June, high levels of oat crown rust were found in plots and low levels in fields in southern Minnesota. During the last week of June, high levels of crown rust were found in oat fields in eastern Nebraska and low levels in plots and fields in eastern South Dakota. In early July, trace levels of crown rust were found in plots in northeastern Wisconsin. In mid-July, moderate to severe levels of oat crown rust were found in plots and fields from northeast South Dakota to central Wisconsin. In late July, moderate to severe levels of oat crown rust were found in plots and fields from central North Dakota to northwest Minnesota.

The crown rust development in the northern oat growing area was more severe this year because of earlier than normal warm temperatures that caused an early release of aecial spores from the rust infected alternate host buckthorn bushes.

In early July, low levels of crown rust were found in oat plots in southern Manitoba.

Buckthorn. On April 2, buds on buckthorn, the alternate host for oat crown rust, were breaking dormancy in the buckthorn nursery at St. Paul, Minnesota. This was two weeks earlier than normal for buckthorn development in these plots. In mid-April, pycnia were developing on the buckthorn leaves at the St. Paul, Minnesota nursery. On May 11, moderate levels of aecial infections were observed on buckthorn in the nursery at St. Paul. During the third week in May, moderate levels of aecial infections were observed at St. Paul nursery. In mid-May, severe levels of aecial infections were noted on buckthorn in Brooking and Minnehaha counties in eastern South Dakota. The crown rust aecia on the buckthorn leaves provided an ample source of spores for infecting the oat crop in northern oat growing region.

Barley Stem Rust. In mid-June, the first report of barley stem rust in 2010 was in a plot at Lincoln, Nebraska. In early July, low levels of stem rust were found in a plot of the old spring barley variety Hypana at the Rosemount Experiment Station in east central Minnesota. In mid-July, low levels of stem rust were found in plots of spring barley at the Morris experiment station in west central Minnesota.

Barley Leaf Rust. In early March, severe levels of barley leaf rust were found on volunteer barley plants at the College Station, Texas experiment station. In mid-April, 60% leaf rust severities were reported on susceptible entries in winter barley nurseries at Mt. Vernon, in western Washington. This year in Virginia there was a considerable amount of barley leaf rust in plots at Painter, Blacksburg and Warsaw. Heavy leaf rust infection was found in a barley field near Lewes, Delaware. In mid-June high levels of barley leaf rust were observed in winter barley plots at the Arlington research station in south central Wisconsin. On June 18, traces of barley leaf rust were observed in an Ithaca, New York plot. In late June, high levels of leaf rust were reported in a spring barley plot at the Waseca experiment station in southern Minnesota. On July 8, 10% leaf rust severities were observed in a barley plot in Ithaca, New York. In 2010, barley leaf rust was more severe and scattered more extensively than normal



throughout the U.S. This was due to a wetter than normal year in much of the U.S.

Barley Stripe Rust. In mid-April, stripe rust reached 80% severity on susceptible entries in winter barley nurseries at Mt. Vernon in western Washington, which was slightly higher than last year at the same location. In late April, there also were reports of barley stripe rust being found in California and western Oregon. In early June, low levels of stripe rust were found in a few barley fields in Whitman County, Washington. In mid-June, barley stripe rust levels were low in fields and plots in eastern Washington. In late June, high levels of barley stripe rust were found in experimental nurseries in the Palouse area in southeastern Washington. In 2010, barley stripe rust was more severe than normal in the Pacific Northwest.

Rye Leaf Rust. In mid-April, leaf rust was found in Elbon rye plots at McGregor, Texas. During the third week in May, leaf rust was found in winter rye plots in east central Minnesota. In early June, low levels of rye leaf rust were found in a north central Kansas field and in a field in south central Wisconsin. On June 17, severe levels of leaf rust were found in winter rye fields in Iowa County in southwestern Wisconsin. In late June, high levels of rye leaf rust were found in southern and west central Minnesota plots.

Thank you!

This is the last issue of the Cereal Rust Bulletin for the 2009-2010 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
Kathy Burch	AL	Christina Cowger	NC
Gene Milus	AR	Paul Murphy	NC
Jason Kelley	AR	Dixie Denis	ND
Rick Cartwright	AR	John Lukach	ND
Scott Monfort	AR	Marcia McMullen	ND
Jorge Dubcovsky	CA	Maricelis Acevedo	ND
Zewdie Abate	CA	Mike McMullen	ND
Ned Tisserat	CO	Sam Markell	ND
Scott Haley	CO	Shaobin Zhong	ND
Bob Mulrooney	DE	Drew Lyon	NE
Ann Blount	FL	Gary Hein	NE
Ron Barnett	FL	Janelle Millhouse	NE
Alfredo Martinez	GA	Ken Herz	NE
Dan Bland	GA	Stephen Baenziger	NE
Jerry Johnson	GA	Stephen Wegulo	NE
John Roberts	GA	Gary Bergstrom	NY
John Youmans	GA	K. Witkop	NY
Forrest Nutter	IA	Mike Stanyard	NY
Jianli Chen	ID	Pierce Paul	OH
Juliet Windes	ID	Art Klatt	OK
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Bob Bowden	KS	Joe McCray	OK
Brian Olson	KS	Ray Sidwell	OK
Clayton Seaman	KS	Sara Wrinth	OK
Erick De Wolf	KS	Chris Mundt	OR
Joe Martin	KS	Allen Heuer	SD
Jon Appel	KS	B. Kavanaugh	SD
Mark Baus	KS	Jeff Stein	SD
Merle Eversmeyer	KS	L. Giddings	SD
Dave Van Sanford	KY	Larry Osborne	SD
Don Hershman	KY	Lon Hall	SD
Don Groth	LA	Vivek Gupta	SD
Greg Williams	LA	Amir Ibrahim	TX
Guy Padgett	LA	Bryan Simoneaux	TX
Sonny Viator	LA	Dave Worrall	TX
Stephen Harrison	LA	Jackie Rudd	TX
Arv Grybauskas	MD	Jason Baker	TX
Jose Costa	MD	John Goolsby	TX
Adam Gibson	MN	Rex Herrington	TX
Bob Laudon	MN	Ronald French	TX
Bruce Potter	MN	Russell Sutton	TX
Bullo Mamo	MN	Todd Baughman	TX
Doug Holen	MN	Bob Pitman	VA
Jerry Ochocki	MN	Bruce Beahm	VA
Jim Anderson	MN	Carl Griffey	VA
Jochum Wiersma	MN	Wynse Brooks	VA
Leah Roth	MN	Kent Evans	WA
Lucy Wanschura	MN	Mike Pumphrey	WA
Matt Rouse	MN	Tim Murray	WA
Roger Caspers	MN	Xianming Chen	WA
Ruth Dill-Macky	MN	Adrian Barta	WI
Sam Gale	MN	Alan Roelfs	WI
Whitney Place	MN	Gordon Cisar	WI
E. Bruns	MN	John Mochon	WI
A. Gibson	MN	Paul Esker	WI
David Tague	MO		
Laura Sweets	MO		
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Tom Allen	MS	Jason Voogt	Elm Creek, Manitoba, Canada
Linnea Skoglund	MT	Jim Menzies	Winnipeg, Manitoba, Canada
Mary Burrows	MT		

Our sincere apologies if by oversight we have omitted anyone from this list.

I would also like to thank the CDL staff, particularly, Mark Hughes, Jim Kolmer, Yue Jin and Marty Carson.



Fig. 1. Leaf rust severities in wheat fields and plots in 2010

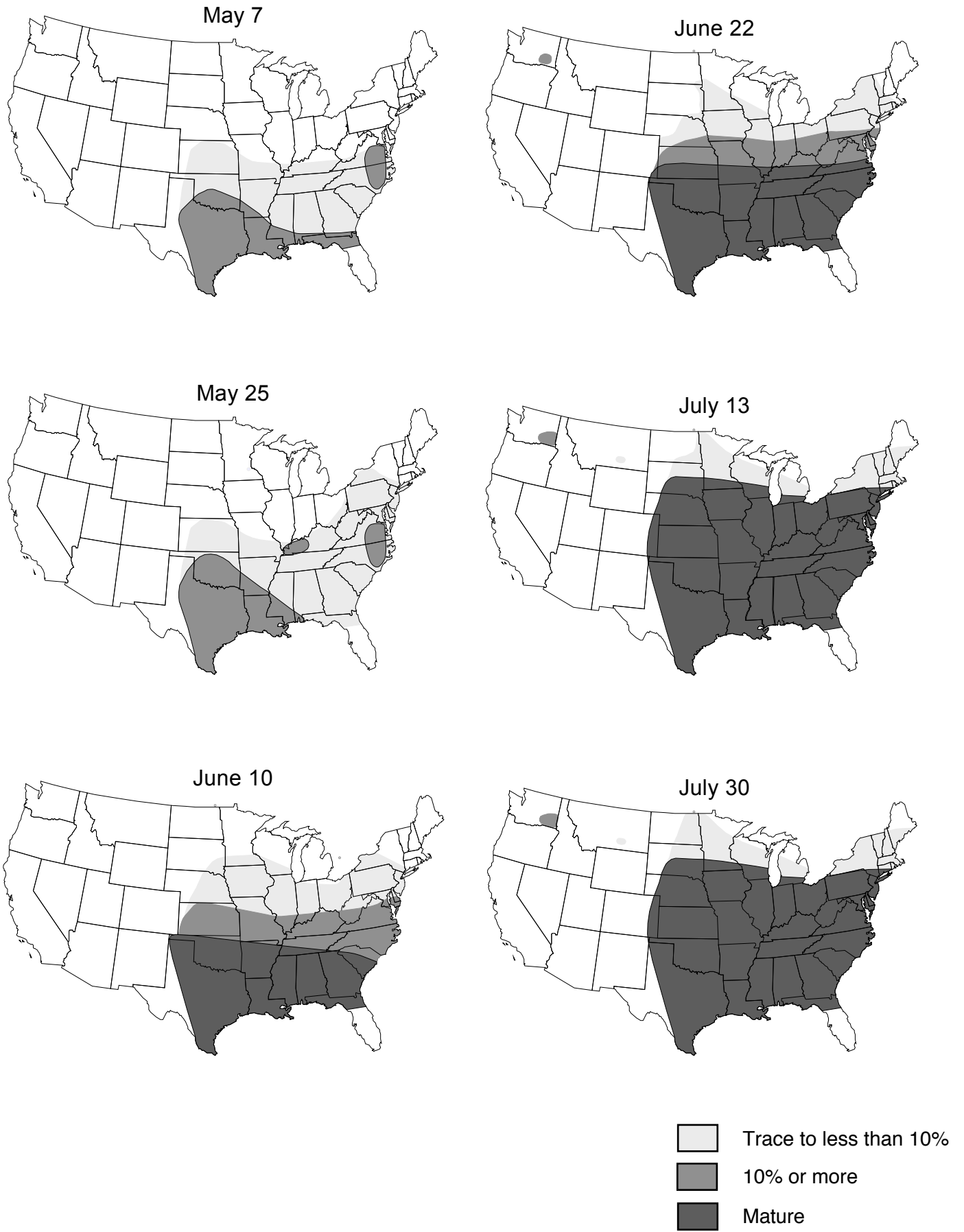


Fig. 2. Stripe rust severities in wheat fields and plots in 2010

