

CEREAL RUST BULLETIN

Report No: 1
April 21, 1982

From:

CEREAL RUST LABORATORY

U. S. DEPARTMENT OF AGRICULTURE
UNIVERSITY OF MINNESOTA, ST. PAUL 55108

Issued By:

SCIENCE AND EDUCATION ADMINISTRATION
AGRICULTURAL RESEARCH
U. S. DEPARTMENT OF AGRICULTURE

(In cooperation with the Minnesota
Agricultural Experiment Station)

Most fall planted wheat emerged from the winter in fair to good condition across the Great Plains. In the central and northern areas, the winter was severe but snow appears to have protected the crop. However, in south Texas, wheat and oats are about three weeks later than normal in maturity. Spring planting of oats and barley is nearly completed in the central plains, but in the northern plains initial planting has been delayed by cool wet soils. Although time is not yet critical, the long range forecast of above normal precipitation is not favorable for rapid progress in soil preparation and planting.

Wheat stem rust--Stem rust was found in centers in trap plots of McNair 701 at Uvalde, Texas on April 12. These centers had severities of 80 to 100 percent at the center and were less than 6 feet in diameter. No other wheat stem rust has been reported in the United States. Traces of stem rust were present in a susceptible wheat in a nursery at Rio Bravo, near Matamoros, Mexico on March 31. The earliest planting (November 1) of Salamanca S75 was lightly rusted at Celaya, Guanajuato, Mexico on April 2, but the rust had not yet spread into the November 15 or later plantings. No stem rust was observed on wheat in commercial fields in northern Mexico, although, some was present on barley.

Wheat leaf rust--In the Gulf Coast area of the United States, leaf rust increased rapidly during the early winter and slowed during the cool winter months. With an increase in temperature in March, a rapid increase of disease has occurred on susceptible cultivars. Leaf rust will cause heavy losses in susceptible cultivars. Several fields of Coker 68-15 were severely rusted at heading. Leaf rust races UN-2 (virulent on Lr3a and 10) and UN-3 (virulent on Lr2c, 3a, 3b, and 10) were identified from collections made in mid-March in central Louisiana and two different races of UN-2 (virulent on Lr3 and Lr3 and 10) from south Texas. Race UN-2 and 3 were the most common races identified by us in the southern United States in 1981. By mid-April, many fields in south Texas were heavily rusted at the berry stage and others were heavily infected but moderately resistant. The southern leaf rust sources will probably provide inoculum for the more northern wheat areas.

A very serious fall leaf rust epidemic occurred in southeast Colorado and adjoining areas of Kansas, Oklahoma and Texas. It was apparent, by early April, that leaf rust had survived the winter as far north as the Nebraska border in at least trace amounts. This provides a source and amount of inoculum that has not been common in mid April in recent years.

Wheat stripe rust--No stripe rust was found on wheat in southern Texas in late March and early April. Moderate disease severities were found on susceptible plants in a nursery at Celaya, Guanajuato, Mexico. Stripe rust was light and scattered on commercial cultivars in this nursery, and none was observed in commercial fields. An infected area in the corner of a field was found in the state of Sonora near Cd. Obregon in late March. Stripe rust rarely occurs naturally in this area of Mexico.

April 21, 1982

Oat stem rust--Stem rust was present on early planted oats in a Beeville, Texas, nursery by March 30, 1982. By April 12, stem rust was present across southern Texas as far north as Austin and in a few early fields nearly every stem was infected in fields near San Antonio. It is anticipated that there will be a major increase in oat stem rust in south Texas before crop maturity in early to mid-May. Oat stem rust was moderate to heavy across northern Mexico on wild oats, (*Avena fatua*) in the states of Sonora, Sinaloa, and Coahuila. Stem rust was present in trace amounts on oat cultivars in a Celaya, Guanajuato nursery and in commercial fields in northern Coahuila near Torreon and Nueva Rosita.

Oat crown rust--Oats are now headed across south Texas and crown rust is widespread but light to moderate in severity. Crown rust will probably be severe on the most susceptible cultivars by maturity. Coker 234 was resistant and TAM 0312 had little rust in late March. Crown rust was heavy on wild oats, *Avena fatua*, across northern Mexico and on commercial oats in the north part of the state of Coahuila.

Barley stem rust--Little commercial barley was observed in Mexico and none in south Texas. Stem rust was found in commercial fields of barley in the dough stage near Monclova and northeast of Nueva Rosita in the state of Coahuila, Mexico.

Barley leaf rust--Leaf rust is light on barley in Mexico, and none was observed on the little barley seen in southern Texas nurseries.

CEREAL RUST BULLETIN

Report No: 2
May 12, 1982.

From:
CEREAL RUST LABORATORY
U. S. DEPARTMENT OF AGRICULTURE
UNIVERSITY OF MINNESOTA, ST. PAUL 55108

Issued By:
SCIENCE AND EDUCATION ADMINISTRATION
AGRICULTURAL RESEARCH
U. S. DEPARTMENT OF AGRICULTURE
(In cooperation with the Minnesota
Agricultural Experiment Station)

Winter wheat crop development is later than normal throughout much of the southern U.S. In the southeast, the average maturity is one week later than normal. In the vicinity of the Gulf coast in the southeastern U.S. a few Soft Red Winter wheat cultivars did not vernalize adequately. In Texas, most fields are 2-3 weeks late, while in Kansas maturity is approximately normal. In the northern Great Plains, seeding of small grains progressed rapidly during the last week of April, but rains in early May have disrupted planting which will make some areas several weeks late.

Wheat stem rust--Stem rust was found in Soft Red Winter wheat varietal plots in southern and central Louisiana during a small grain disease survey the last week of April (Long). No overwintering centers were observed nor was any stem rust observed in any commercial southeastern U.S. wheat fields. Stem rust previously reported in a Uvalde, Texas, nursery has spread throughout the nursery but stem rust was not found elsewhere in Texas (Roelfs).

Wheat leaf rust--Leaf rust is a severe problem throughout southeastern U.S. Soft Red Winter wheat fields and nurseries. For example, in some southeastern Arkansas fields wheat was in late anthesis growth stage and leaf rust severity read 40% on flag leaves (Long). Losses will occur in these fields. Throughout the southeastern U.S. wheat growing area many of the commonly grown cultivars (Coker 68-15, McNair 1003, Arthur 71) are severely rusted, while in the same area other less widely grown cultivars (Coker 762, Coker 797, Florida 301) only have traces of leaf rust. Texas winter wheat fields showed a definite line from Dallas to Brownwood in that south of this line, leaf rust was severe (80 to 100 percent) whereas north, severities decreased quickly to only a trace (Roelfs). In the most severely infected area plants were already defoliated at the berry stage. South of this line, the resistance offered by Arthur 71 (Lr9), Coker 68-15, and Sturdy was inadequate, while to the north these cultivars were adequately resistant to prevent major losses. With the anticipated leaf rust increase, severities at mid-dough (after May 24) are expected to be 30 to 60 percent in north Texas as far west as Vernon, but this late development should result in only a trace loss.

Leaf rust races UN-2 (virulent on Lr3a and 10) and UN-3 (virulent on Lr2c, 3a, 3b, 9, and 10) were identified from collections made in mid-March in central Louisiana. From south Texas collections three different types of race UN-2 were identified (virulent on Lr3a; Lr3a and 10; and Lr3a, 10, and 24). In the same area, the UN-3 race (virulent on Lr2c, 3a, 3b, 9, and 10) was identified.

Wheat stripe rust--Stripe rust was found in a Soft Red Winter wheat field in north central Texas (Nelson). The severity was 30% at early anthesis in this field; however, with an increase in temperature this rust will not increase significantly. Traces of stripe rust were observed on Pacific Northwest wheats (Line).

Oat stem rust--Stem rust is widespread but light in commercial fields as far north as Temple, Texas (Roelfs), and isolated infections occur as far north as Dallas. This inoculum apparently came from south Texas and with favorable

May 12, 1982

conditions should increase rapidly in the next week. During the last week in April, oat stem rust was found in southern Louisiana and Alabama nurseries (Long). Rust was found in a southern Louisiana commercial field but the crop was too mature for significant losses to occur. Races NA-5, 16, and 27 were identified from the first oat collections of 1982, from the Beeville, Texas, nursery. The same races were identified from this nursery in 1981.

Oat crown rust--Crown rust development is severe in central Texas south of a line from Temple to Brownwood and light as far north as the Oklahoma border. Severe rust was observed in plots in southeastern U.S. on some cultivars. In the south, the best commercial resistance was offered by Coker 227 and 234, Big Mac, and Mesquite.

Barley leaf rust--Leaf rust was found in Virginia (Roane) and North Carolina (Newton) nursery plots in significant amounts. Traces exist in nurseries in central Texas. No leaf rust was observed in the southeast states.

Rye rust--Leaf rust was common on cultivars in the southeastern U.S. but not as severe as on the common wheat cultivars. Leaf rust was light on rye in Texas. Leaf rust has been observed overwintering on rye in Minnesota (McVey). No stem rust was observed on rye.

Other diseases--In the southeastern U.S. Septoria nodorum (glume blotch) was observed and appeared to be related to cultivars whereby one field was severely infected while in the next field only traces were found. Powdery mildew was found in southeastern U.S. wheats, with degree of severity depending on location and cultivar.

CEREAL RUST BULLETIN

Report No: 3
May 25, 1982

From:
CEREAL RUST LABORATORY
U. S. DEPARTMENT OF AGRICULTURE
UNIVERSITY OF MINNESOTA, ST. PAUL 55108

Issued By:
SCIENCE AND EDUCATION ADMINISTRATION
AGRICULTURAL RESEARCH
U. S. DEPARTMENT OF AGRICULTURE
(In cooperation with the Minnesota
Agricultural Experiment Station)

The small grain harvest is in full swing throughout the extreme southern United States. In Kansas and Oklahoma, recent rains improved wheat conditions statewide and crop maturity is near normal to one week late. It varies from early dough in drought stressed southwest Oklahoma to one-fourth berry at the Oklahoma-Kansas border to late boot in north central Kansas. Seeding of small grains in the northern Great Plains was slowed because of prolonged cloudy, wet weather.

Wheat stem rust--Stem rust was found in the Soft Red Winter Wheat breeding plots but none in the commercial varietal nursery at the Quincy, Florida, experiment station (Barnett) in mid-May. The stem rust races TNM and QFB were identified from the collections made in McNair 701 trap plots at Uvalde, Texas. No stem rust was observed in Kansas and Oklahoma last week. The stem rust races RKQ (78%) and TNM (22%) were identified from collections made in eastern Mexico in early April.

Wheat leaf rust--Leaf rust was observed in the Soft Red Winter Wheat areas of Missouri, Tennessee, and North Carolina. Severe leaf rust probably accounts for much of the low bushel weights and yield/acre reported in the extreme southern Soft Red Winter Wheat area. Leaf rust is widespread throughout Oklahoma and Kansas but generally is confined to the lower leaves although traces are present on the flag leaves (Roelfs and Browder). However, there is a narrow strip of moderately infected wheat from Chickasha to Enid, Oklahoma, where some plants were defoliated in the berry stage. In Kansas, the leaf rust is light west of Highway 81 and present in trace amounts to the east as far north as the Nebraska border. Severities will increase rapidly but should generally result in little loss. Leaf rust is light in the state of Washington, and weather will be the determining factor in the next two weeks for degree of severity (Line). The first traces of wheat leaf rust in Minnesota were found May 20 in the Rosemount winter wheat nursery (Long). This is near normal for the first leaf rust appearance on winter wheat in this area.

From 1982 south Texas collections, three different types of race UN-5 were identified (virulent on Lr 1, 3a, 10; Lr 1, 3a, 10, 17, 18; and Lr 1, 3a, 10 and 24). Leaf rust races UN-17 (virulent on Lr 2a, 2c, 3a, and 10) and UN-13 (virulent on Lr 1, 2a, 2c, 3a, 10, 17, and 18) were also found. These three UN races were identified from this area in the last three years. Nine different virulence combinations have now been identified from southern Texas and Louisiana so far this season.

Wheat stripe rust--Stripe rust was observed in south central Kansas in a commercial field and in a nursery at Woodward, Oklahoma. The stripe rust in Washington isn't increasing very fast and the rust probably will be a problem only on the most susceptible cultivars (Line).

Oat stem rust--No stem rust was found on oats in Oklahoma or Kansas last week (Roelfs and Browder). Races identified from collections made in south Texas in early April were NA-27 (93%), NA-16 (6%) and NA-5 (1%). From oats and wild oat collections made in northern Mexico in early April races NA-27 (87%) and NA-16 (13%) were identified.

May 25, 1982

Oat crown rust--No crown rust was found in a survey of Kansas and Oklahoma last week. Aecial development is heavy on the buckthorn bushes at the St. Paul, Minnesota, nursery and aeciospores were released this week (Rothman). Aecia were observed on buckthorn in Dane County, Wisconsin in mid-May.

Barley leaf rust--Leaf rust that probably overwintered was found in barley fields and nurseries in Virginia (Roane). Single pustules were found in plots at Lamberton and St. Paul, Minnesota (Teng).

Barley stem rust--Wheat stem rust race QFB was identified from collections made from barley in the state of Coahuila, Mexico.

Rye stem rust--Stem rust was found on rye in the Tifton, Georgia nursery plots on May 20 (Morey).

Rye leaf rust--Leaf rust in central Kansas varies from light to heavy on individual rye plants in wheat fields.

Barberry rust--The first barberry aecial collection of 1982 was made in Monroe County, West Virginia (Bostic) on May 19.

CEREAL RUST BULLETIN

Report No: 4
June 8, 1982

From:
CEREAL RUST LABORATORY
U. S. DEPARTMENT OF AGRICULTURE
UNIVERSITY OF MINNESOTA, ST. PAUL 55108

Issued By:
SCIENCE AND EDUCATION ADMINISTRATION
AGRICULTURAL RESEARCH
U. S. DEPARTMENT OF AGRICULTURE
(In cooperation with the Minnesota
Agricultural Experiment Station)

The small grain harvest is progressing into north central Texas, southwest Oklahoma and the northern areas of the Southeastern states. The winter wheat crop ranges from good to excellent from north central Texas northward to Nebraska. The majority of the spring sown small grains are now seeded in the northern Great Plains.

Wheat stem rust--Stem rust collections were made in a Yuma, Arizona nursery (Diehl) during the last week in May. The last stem rust collection made in this area was in 1978. Races identified from collections received prior to May 1 are as follows:

<u>Location</u>	<u>No. of collections</u>	<u>Wheat stem rust CRL races (No. of isolates)</u>
S. Texas	12	TNM(25) QFB(5) RHR(1)
Louisiana	7	QCB(10) QFB(6) RKQ(3) TNM(2)
Mexico	5	RKQ(7) QFB(6) TNM(2)

From the initial 1982 stem rust collections the TNM race is the most common race while in 1981 from the same U.S. area QFB was the common race.

Wheat leaf rust--Heavy leaf rust was observed in Soft Red Winter Wheat fields in southern Illinois and Indiana the first week in June. Leaf rust decreased significantly further northward in these states, but with continued good moisture and warm temperatures rust will increase. Heavy leaf rust was noted in Tennessee (Chambers) and Virginia (Roane) nurseries. In Kansas, the latest cool moist weather has slowed wheat development and this has allowed leaf rust to build up rapidly. Rust is severe on the cultivar Newton. Leaf rust is increasing rapidly in southeast Minnesota where it was first found on May 27 in trap plots of susceptible cultivars. Since that date, rust has been found in many of the common cultivars grown in Minnesota and with more cool moist weather this rust will increase at a fast rate. It is hoped that the adult plant resistance of Era (primary cultivar in Minnesota) will be adequate to prevent a serious rust buildup on the flag leaf. Damage to the flag leaf prior to early dough can have a drastic effect on grain yield. Leaf rust is increasing slowly in the Pacific Northwest (Line).

From the 1982 southern Alabama collections, 8 different leaf rust race combinations were identified. Three different types of race UN-2 were identified (virulent on Lr3a; Lr3a, 10, and Lr3a, 9, 3b). Leaf rust races UN-3 (virulent on Lr2c, 3a, 9, 10, 3b), UN-5 (virulent on Lr1, 3a, 10, 17, 18), UN-6 (virulent on Lr1, 2c, 3a, 10, 3b), UN-13 (virulent on Lr1, 2a, 2c, 3a) and UN-14 (virulent on Lr1, 2c, 10) were also found. These races were identified from 18 collections made on Soft Red Winter Wheat cultivars in 5 southern Alabama varietal nurseries.

From Mexico leaf rust collections were identified the races UN-10 (virulent on Lr2c, 10, 17, 18), UN-2 (virulent on Lr3a, 10, 24), UN-13 (virulent on Lr1, 2a, 2c, 3a, 10, 17, 18) and UN-17 (virulent on Lr2a, 2c, 3a, and 10).

June 8, 1982

Wheat stripe rust--Traces of stripe rust were reported in another field in central Kansas. In western Washington stripe rust has developed on the susceptible cultivars but less is present on the commonly grown cultivars (Line). In eastern Washington, stripe rust has increased even slower on the susceptible cultivars. Western Oregon is drier than normal and therefore the disease is much less than normal. Losses should be significantly less than last year in the Pacific Northwest.

Oat stem rust--During the last week in May, moderate stem rust was noted in a central Texas nursery (McDaniel). No stem rust has yet been reported outside Texas in the Great Plains. Races Identified from collections received prior to May 1 are as follows:

<u>Location</u>	<u>No. of collections</u>	<u>Oat stem rust NA races (No. of isolates)</u>
South Texas	31	NA-27(83) NA-16(6) NA-5(1)
Central Texas	7	NA-27(21)
Louisiana	2	NA-5(3) NA-27 (3)
Alabama	1	NA-16(3)
Mexico (oats)	3	NA-27(9)
(wild oats)	12	NA-27(32) NA-16(4)

Oat crown rust--Rust was noted in Wisconsin fields the first week in June where buckthorn was found along the edges of these fields. This week the aeciospore numbers have increased significantly in the buckthorn nursery at St. Paul, Minnesota. No crown rust has been reported in commercial spring planted oat fields.

Barberry rust--Barberry aecial collections were made in five different locations June 1 in Minnesota counties of Winona and Fillmore (Schlick).

CEREAL RUST BULLETIN

Report No: 5
June 22, 1982

From:
CEREAL RUST LABORATORY
U. S. DEPARTMENT OF AGRICULTURE
UNIVERSITY OF MINNESOTA, ST. PAUL 55108

Issued By:
SCIENCE AND EDUCATION ADMINISTRATION
AGRICULTURAL RESEARCH
U. S. DEPARTMENT OF AGRICULTURE
(In cooperation with the Minnesota
Agricultural Experiment Station)

The hard red winter wheats are mature into southern Kansas. However, wet soils are delaying harvest, but as fields dry it will proceed at a fast pace across Oklahoma, Kansas and into Nebraska. The spring sown small grains are behind normal maturity because of cool temperatures, a lack of sunshine and a later than usual planting date.

Wheat stem rust--In the past two weeks stem rust was found on susceptible wheat cultivars in nurseries in southeast Arkansas (Bassi), central Kansas (Willis) and northern Kansas (Long). The first stem rust collection in 1982 was made in a commercial field in Kansas (Willis). Races identified from collections received prior to May 14 are as follows:

<u>Location</u>	<u>No. of collections</u>	<u>Wheat stem rust CRL races (No. of isolates)</u>
S. Texas	12	TNM(25) QFB(5) RHR(1)
Florida	2	TNM(6)
Louisiana	7	QCB(10) QFB(6) RKQ(3) TNM(2)
Mexico	5	RKQ(7) QFB(6) TNM(2)

Wheat leaf rust--Most commercial fields in Indiana are reading about 50% leaf rust severity. Both the Lr 9 and Arthur-type resistance are being attacked. The new cultivars Auburn, Caldwell and Fillmore are reading 0-trace severity (Roberts). Leaf rust is now severe on some of the commonly grown cultivars in northern Kansas. For example, Newton in the late berry stage had a 60% severity on the flag leaf. Losses due to leaf rust will occur in these fields. However, in the same area only light amounts of leaf rust were found on other cultivars such as Sage and TAM-105. Northward from Kansas through the Great Plains, leaf rust severities on winter wheat decrease and only traces were found in North Dakota (Statler). Leaf rust is currently light on most of the commonly grown spring wheat cultivars (Bissonette). With continued cool moist weather the disease will increase rapidly, and some losses can subsequently be expected in susceptible spring wheats. In the Pacific Northwest leaf rust is present, but dry weather has been unfavorable for further rust development except in irrigated fields (Line).

Stripe rust--Stripe rust was found scattered throughout the Great Plains from northwestern Kansas (Long) to Fargo, North Dakota (Miller) on different wheat cultivars. With continued cool moist conditions this rust should become more easily visible on the leaves as the disease increases. In the Pacific Northwest stripe rust is severe on the susceptible cultivars but cultivars with high-temperature, adult-plant resistance rust are not seriously rusted (Line).

Oat stem rust--Oat stem rust was found in northwestern Kansas (Long) and southeastern Arkansas (Bassi) in trace amounts, and a single pustule at Rosemount Minnesota (McVey). These are the first reports of oat stem rust outside of Texas in 1982. In central Texas nurseries, rust developed on CI 9221 which previously had been resistant to stem rust (McDaniel). Races identified from collections received prior to May 10 are as follows:

<u>Location</u>	<u>No. of collections</u>	<u>Oat stem rust MA races (No. of isolates)</u>
South Texas	71	NA-27(188) NA-16(10) NA-5(1) NA-23(1)
Central Texas	16	NA-27(41) NA-16(3) NA-23(2)
Alabama	1	NA-16(3)
Louisiana	2	NA-27(3) NA-5(3)
Mexico (oats)	3	NA-27(9)
(wild oats)	12	NA-27(32) NA-16(4)

Oat crown rust--Crown rust was observed from northern Kansas to central Minnesota (Hitman) and Wisconsin this past week. In many Kansas locations crown rust severity was 20% on flag leaves and in the north only scattered traces were found.

Barley leaf rust--Leaf rust was light in Kansas fields and nurseries. As of June 21, only traces have been found in Minnesota or North Dakota.

Rye leaf rust--Rye leaf rust was found in rye growing South Dakota, Nebraska, and Minnesota in the last two weeks. Severities as high as 80% are present on some plants of winter rye. Generally spring planted rye is only lightly rusted.

Barberry rust--Aecial collections were made on barberry in Ontario, Canada, during the first part of June.

Incidence of virulence in wheat leaf rust on the single gene differentials from isolates collected in trap plots and commercial fields in 1982.

<u>Race and virulence</u>	<u>No. of isolates</u>			<u>Total</u>
	<u>Alabama</u>	<u>Louisiana</u>	<u>Texas</u>	
<u>UN 2</u>				
3a	2		2	4
3a, 10	3	8	13	24
3a, 10, 24			2	2
3a, 9, 3b	2		2	4
<u>UN 3</u>				
2c, 3a, 9, 10, 3b	17	14		31
<u>UN 5</u>				
1, 3a, 10			3	3
1, 3a, 10, 17, 18	3		7	10
1, 3a, 10, 24			2	2
<u>UN 6</u>				
1, 2c, 3a, 10, 3b	2			2
<u>UN 13</u>				
1, 2a, 2c, 3b	3			3
1, 2a, 2c, 3b, 10, 17, 18		2	2	4
<u>UN 14</u>				
1, 2c, 10	8			8
<u>UN 17</u>				
2a, 2c, 3a, 10			7	7
<u>Totals</u>	<u>40</u>	<u>24</u>	<u>40</u>	

CEREAL RUST BULLETIN

Report No: 6
July 7, 1982

From:
CEREAL RUST LABORATORY
U. S. DEPARTMENT OF AGRICULTURE
UNIVERSITY OF MINNESOTA, ST. PAUL 55108

Issued By:
SCIENCE AND EDUCATION ADMINISTRATION
AGRICULTURAL RESEARCH
U. S. DEPARTMENT OF AGRICULTURE
(In cooperation with the Minnesota
Agricultural Experiment Station)

The hard red winter wheat crop has been harvested in much of Oklahoma and harvest is in full swing throughout Kansas where the fields are dry. Harvest of soft red winter wheat has progressed into Indiana, Illinois and northern Missouri. Wheat harvest in western Tennessee is now completed and most of the wheat acreage was immediately replanted to soybeans. The small grain crop development in the northern Great Plains advanced very rapidly the first week of July under very hot and dry winds. The forecasted dry week will advance maturity even more.

Wheat stem rust--In the past two weeks naturally occurring stem rust was found on susceptible cultivars in nurseries at Richland, Indiana (Vian), Lafayette, Indiana (Roberts), and Rosemount, Minnesota (McVey). Normally by this date, wheat stem rust has been found as far north as southern North Dakota. With continued very low amounts of stem rust it appears no losses will occur in the United States in 1982.

Table 1. Preliminary data of the 1982 wheat stem rust race survey (7-6-82).

<u>Location</u>	<u>No. of Collections</u>	<u>Wheat stem rust CRL races (No. of isolates)</u>
S. Texas	12	TNM(25) QFB(5) RHR(1)
C. Texas	1	TNM(2) QFB(1)
Arizona	3	QSH(6) TNM(3)
Louisiana	7	QCB(10) QFB(6) RKQ(3) TNM(2)
Mexico	5	RKQ(7) QFB(6) TNM(2)

Wheat leaf rust--Leaf rust is present in light amounts in Nebraska winter wheat fields. Leaf rust is severe in the winter wheats in Indiana, Minnesota, South Dakota, and Wisconsin and will cause some losses in the late maturing susceptible cultivars. Final severities of 70-80% were observed on flag leaves on the Arthur-type wheats in Indiana (Roberts). Fungicide spray tests for leaf rust control at Milam, Tennessee, provided a 15-bushel increase on susceptible cultivars (Chambers). Throughout much of the spring wheat growing area, leaf rust is present but the cool dry period followed by hot (90-100°F) and windy weather has been unfavorable for rust development. Initial Minnesota leaf rust race identifications (see Table 3.) show two races (UN-3 and 17) which have been identified in previous years from this area. In the Pacific Northwest the recent wet weather has created conditions more suitable for leaf rust increase but most of the winter wheat crop is too mature for losses to occur (Line).

Wheat stripe rust--Stripe rust was found June 23 in a Rosemount, Minnesota, winter wheat nursery (Long). The disease was present in trace amounts because of dry weather which is not conducive to stripe rust development. The hot winds of July 5 have now dried these leaves. In the Pacific Northwest, the light disease severity during the early spring, the high temperatures, and the adult-plant resistance of the commonly-grown cultivars have combined to result in less than usual stripe rust severities. In a southern Utah nursery stripe rust overwintered and resulted in a hot spot, but only light amounts occurred in commercial fields in the same area (Line).

July 7, 1982

Oat stem rust--In the past two weeks, stem rust was found in nurseries in Ames, Iowa (Simons). Normally by this date stem rust has been reported as far north as southern South Dakota.

Table 2. Preliminary data of the 1982 oat stem rust race survey (7-6-82).

<u>Location</u>	<u>No. of collections</u>	<u>Oat stem rust NA races (No. of isolates)</u>
South Texas	81	NA-27(205) NA-16(10) NA-5(1) NA-23(2)
Central Texas	24	NA-27(61) NA-16(3) NA-23(2)
Alabama	1	NA-16(3)
Louisiana	2	NA-27(3) NA-5(3)
Mexico (oats)	3	NA-27(9)
(wild oats)	12	NA-27(32) NA-16(4)

Oat crown rust--Trace amounts of oat crown rust were found in southern Minnesota oat fields on the flag leaves. In the Minnesota nurseries the rust is increasing and in a nursery in close vicinity to buckthorn bushes, the rust is severe. However, recent hot winds should limit crown rust development to very light amounts except in late planted fields.

Barley leaf rust--Leaf rust is light in western Washington and northern California fields (Line). In South Dakota and southern Minnesota, barley is reaching the dough stage with traces of leaf rust present.

Rye rusts--Traces of rye stem rust were found in the Rosemount nursery on June 23. Leaf rust remains severe in winter ryes in southern Minnesota.

Barberry rust--Three isolates of the oat stem rust race NA-5 were identified from the initial 1982 West Virginia barberry aecial collections. Rye stem rust was identified from 1982 collections made in the state of Minnesota and province of Ontario, Canada.

Other diseases--The unusual wet weather in June across the central Great Plains has resulted in unusual amounts of tan spot, Septoria tritici, Septoria nodorum, and scab. Scab is very severe in northeast Nebraska. These diseases along with leaf rust and wet conditions have resulted in grain of rather poor appearance and some of poor quality.

Table 3. Preliminary data from an epidemiological virulence survey of wheat leaf rust collections received prior to May 11, 1982.

Race and virulence	No. of isolates					Total
	Alabama	Florida	Georgia	Louisiana	Texas	
<u>UN-2</u>						
Lr3a	4				2	6
3a,10	3	2	6	8	13	32
3a,10,24					2	2
3a,9,3b	2				2	4
<u>UN-3</u>						
2c,3a,9,3b	12	4	13			29
2c,3a,9,10,3b	17			14		31
<u>UN-5</u>						
1,3a,10			1		3	4
1,3a,10,17	3				7	10
1,3a,10,24		2	2		2	6
<u>UN-6</u>						
1,2c,3a,9,3b	3		3			6
<u>UN-13</u>						
1,2a,2c,3a	3	4				7
1,2a,2c,3a,10,17		1	1	2	2	6
<u>UN-14</u>						
1,2c,10	8	2				10
<u>UN-17</u>						
2a,2c,3a,10	1	1	4		7	13
Totals	56	16	30	24	40	166

CEREAL RUST BULLETIN

Report No: 7
July 14, 1982

From:
CEREAL RUST LABORATORY
U. S. DEPARTMENT OF AGRICULTURE
UNIVERSITY OF MINNESOTA, ST. PAUL 55108

Issued By:
SCIENCE AND EDUCATION ADMINISTRATION
AGRICULTURAL RESEARCH
U. S. DEPARTMENT OF AGRICULTURE
(In cooperation with the Minnesota
Agricultural Experiment Station)

The winter wheat harvest has advanced into southeastern South Dakota and southern Minnesota; however, continuing showers are delaying harvest in local areas. Spring grains are developing at a fast pace in much of the upper midwest and nearing normal maturity for this date; however, in northern North Dakota and northeastern Montana the crop is 2-3 weeks behind normal. Because of the recent scattered showers a great range exists in crop conditions and disease, often within a few miles.

Wheat stem rust--In the past two weeks, traces of stem rust were found in susceptible trap plots of Baart at Urbana, Illinois (Jedlinski); Ames, Iowa (Simons); Fargo, North Dakota (Miller); and Staples, Minnesota (Roelfs). These infection centers started in late June. This continues the trend of recent years for a light and late initial infection. The commercial spring wheats and durums grown in this area are resistant to the commonly found stem rust races. In the area around Pullman, Washington, traces of stem rust were found in the late winter and spring wheat fields (Line).

Table 1. Preliminary data of the 1982 wheat stem rust race survey (7-19-82).

<u>Location</u>	<u>No. of Collections</u>	<u>Wheat stem rust CRL races (No. of isolates)</u>
Texas	13	TNM(27) QFB(6) RHR(1)
Arizona	3	QSH(6) TNM(3)
Louisiana	7	QCB(10) QFB(6) RKQ(3) TNM(2)
Florida	3	TNM(6) WSH(1) QFB(1) RKQ(1)
Mexico	5	RKQ(7) QFB(6) TNM(2)

Wheat leaf rust--Leaf rust is severe on maturing winter wheat in Minnesota, North and South Dakota. Severities are higher than usual in many of the commonly grown spring wheat cultivars (i.e., Era, Butte, and Olaf) especially in areas of the eastern Dakotas and extreme western Minnesota (Roelfs, Statler). The severity of leaf rust on usually resistant spring wheat indicates either; 1) a broadly virulent pathogen, 2) a wide range of different cultures, and/or 3) unusually favorable environmental conditions. The potential for item 2 is demonstrated by the 1982 epidemiological virulence survey where 16 leaf rust single gene combinations (7 UN races) have been identified from collections made in the southern U.S. Updated results from Texas are shown in Table 2.

Table 2. Preliminary data from an epidemiological virulence survey of wheat leaf rust from Texas collections received prior to May 21, 1982.

<u>Race</u>	<u>Virulence</u>	<u>No. of isolates</u>
UN-2	3a	4
	3a, 10	34
	3a, 10, 24	2
	3a, 9, 3b	2
UN-3	2c, 3a, 9, 3b	16
UN-5	1, 3a, 10	15
	1, 3a, 10, 17	7
	1, 3a, 10, 24	6
	1, 3a, 24	1
UN-13	1, 2a, 2c, 3a, 10, 17	2
UN-17	2a, 2c, 3a, 10	25
Total		114

Oat stem rust--In the past two weeks, traces of oat stem rust were found in Michigan (Clayton) and Wisconsin. In Illinois, South Dakota, and Minnesota oat nurseries, rust severities ranged from traces to 2%. In northeast South Dakota, the southeastern 2/3 of North Dakota, and adjacent extreme western Minnesota, an initial infection of stem rust occurred approximately two weeks ago. Infections generally were about 1 per 40 linear feet of row; however, probably due to differences in intensity and area of the showers that deposited the spores, the number of infections in local areas vary from none to 1 per tiller. This is a later input of inoculum than the one found further east on June 10 from which little local spread occurred due to cold or windy nights. Oat stem rust losses in the spring-growing area are only expected in the late maturing fields. Traces of stem rust were found on wild oats (Avena fatua) in the eastern Dakotas and western Minnesota area in the past two weeks.

Table 3. Preliminary data of the 1982 oat stem rust race survey (7-19-82).

<u>Location</u>	<u>No. of Collections</u>	<u>Oat stem rust NA races (No. of isolates)</u>
Texas	150	NA-27(386) NA-16(18) NA-5(5) NA-23(4)
Alabama	1	NA-16(3)
Iowa	1	NA-27(1)
Louisiana	2	NA-27(3) NA-5(3)
Mexico	15	NA-27(41) NA-16(4)

Oat crown rust--In Iowa, which has been unusually wet, the most serious crown rust epidemic since 1957 has occurred (Simons). Losses occurred in many fields. The lack of rain has generally hindered the spread of the disease into Minnesota and the Dakota's. However, a single field was observed last week with an 80% severity in central Minnesota (Roelfs). Hot dry conditions have dried the oat leaves in much of southern Minnesota, west central Wisconsin and parts of eastern South Dakota and northeastern North Dakota. Losses in Minnesota and the Dakota's will be very light except for scattered fields and the late planted material which still could be effected.

Barley leaf rust--Barley leaf rust is severe (flag leaf severities of 80%) in some central South Dakota fields and some losses to leaf rust will occur in this area. Elsewhere in the north central states, the disease generally is light but widespread. Some very late fields exist in northeast North Dakota where severe losses occurred on late plantings last year.

Triticale leaf rust--Leaf rust was heavy on some lines in the Corvallis, Oregon nursery (Mork).

Rye leaf rust--Leaf rust is severe on rye in the north central states.

Barberry rust--The wheat stem rust races TNM, LFB, and MBC were identified from aecial collections made in Ontario, Canada.

CEREAL RUST BULLETIN

FINAL ISSUE
August 4, 1982

From:
CEREAL RUST LABORATORY
U. S. DEPARTMENT OF AGRICULTURE
UNIVERSITY OF MINNESOTA, ST. PAUL 55108

Issued By:
SCIENCE AND EDUCATION ADMINISTRATION
AGRICULTURAL RESEARCH
U. S. DEPARTMENT OF AGRICULTURE
(In cooperation with the Minnesota
Agricultural Experiment Station)

The harvest of small grain cereals has progressed into all areas of the Northern Great Plains. Currently, scattered fields of winter wheat and barley are being harvested as far north as the U.S.-Canadian border. There still is a large variation in crop maturity throughout the northern grain-growing area. In the North Central States, some of the spring planted small grains are behind normal development, but recent warm weather is rapidly advancing crop maturity.

Wheat stem rust--In the past two weeks, traces of stem rust were found scattered in trap plots of susceptible spring wheats throughout Minnesota and North Dakota (Long, Miller). During the same period, stem rust was found in North Dakota (Miller), Oregon (McCustian) and West Virginia (Williams) winter wheat plots. In the Palouse area of Washington, stem rust is scattered and will cause some lower bushel test weights (Line).

In 1982, in summary, stem rust was found April 12 in a trap plot of McNair 701 at Uvalde, Texas. No stem rust was found in northern Texas or Oklahoma, but isolated infections were found in southern Kansas. In July, stem rust was found in the northern Great Plains in scattered light amounts but none developed on the commonly grown cultivars as they remain resistant to stem rust. In the southeastern U.S., stem rust was found in Soft Red Winter Wheat varietal plots in late April and in southeastern Arkansas in late May. Stem rust was present in Illinois in a spring wheat nursery in mid-July. In 1982, throughout much of the wheat growing area of the U.S., stem rust inoculum was present but most of the commonly grown cultivars are resistant to stem rust, therefore there were only negligible losses to this disease. One significant difference between physiological races identified so far in 1982 and 1981 is the increase in race TNM replacing race QFB as the most common race. Thus, 15-TNM regained the position it has held in the U.S. since the early 1970's.

Table 1. Preliminary data of the 1982 wheat stem rust race survey (8/3/82).

Location	No. of collections	Percent of isolates of each race						
		11 RHR	15 TNM	29 HJC	113 RKO	151 QCB	151 QFB	QSH
Arizona	3		33					67
Arkansas	1		100					
Florida	3		67		11		11	11
Kansas	4		83	17				
Louisiana	7		9		14	48	29	
Minnesota	1				50			50
Texas	13	3	79				18	
1982	32	1	57	2	6	11	14	9
1981 (final)	195	-	36	*	1	1	37	2
1980 (final)	43	-	43	1	-	-	23	-

* Less than 0.6%

Wheat leaf rust--In 1982, wheat leaf rust was epidemic throughout most of the Soft Red Winter Wheat growing area and south Texas. Heavy losses occurred in some of the commonly grown cultivars, (i.e. Arthur 71, Coker 68-15, Abe, Oasis and in south Texas, Sturdy), while in the same area other less widely grown cultivars had minimal losses to leaf rust. In north Texas and Oklahoma a combination of a less favorable environment and cultivar resistance was adequate to prevent major losses. In Kansas, wet weather delayed crop maturity and leaf rust increased on some of the commonly grown cultivars (i.e. Newton) and light to moderate losses occurred. In the Northern Great Plains, leaf rust was severe in the winter wheats which resulted in some losses, especially in areas of adequate moisture. Leaf rust was observed at an early date on the Northern Great Plains spring wheats and became more severe than usual in many of them, especially in areas where winter wheat is also grown. Warm weather in July resulted in the crop maturing rapidly and the cultivar resistance was adequate to prevent a serious rust buildup on the flag leaf. Cultivars grouped for resistance are: highly resistant--Alex, Coteau, Len; resistant--Kitt, Marshall; and moderately resistant--Butte, Era, Olaf. In the Pacific Northwest, leaf rust was present but the dry weather early in the season was unfavorable for severe rust development. However, later in the season leaf rust became severe and test weights will be lowered in spring wheats.

The leaf rust race survey as shown in Table 2 is nearly one-half complete. Presently, the three most commonly identified races are UN-2 (virulent on 3a, 10), UN-3 (virulent on 2c, 3a, 9, 3b) and UN-17 (virulent on 2a, 2c, 3a, 10). The UN-3 race which is virulent on Lr9 accounted for the severe leaf rust on many of soft winter wheat cultivars. The UN-2 and UN-17 races were the two most commonly identified races in the 1981 virulence survey, and their numbers probably will increase as the northern U.S. collections are identified. Seventeen leaf rust virulence combinations (7 UN races) have been identified from preliminary U.S. collections.

Table 2. Preliminary data from virulence survey of wheat leaf rust collections received prior to May 21, 1982.

Race and virulence*	No. of isolates per state												Totals
	AL	AK	FL	GA	KS	LA	MS	NC	OK	SC	TN	TX	
UN-2													
Lr3a	4	2		1	1	2				4		4	18
3a,10	11	1	2	6	2	9			8			32	71
3a,10,24												3	3
3a,9,3b	3					2	4					4	13
UN-3													
2c,3a,3b							4						4
2c,3a,9,3b	14		3	11	2		4	6		1	2	17	60
2c,3a,9,10,3b	27			2		14							43
UN-5													
1,3a,10				1	1							15	17
1,3a,10,17	3	7										7	17
1,3a,10,24			2	2								6	10
UN-6													
1,2c,3a,9,3b	1			3									4
1,2c,3a,10,3b	2												2
UN-13													
1,2a,2c,3a	3		4										7
1,2a,2c,3a,10,17			1	2		2						1	6
1,2a,2c,3a,10,17,3b												2	2
UN-14													
1,2c,10	8		2										10
UN-17													
2a,2c,3a,10	1		1	4	1				2			25	34
Totals	77	10	15	32	7	29	12	6	10	5	2	116	321

* The Lr single gene differentials tested in leaf rust race identification were

Wheat stripe rust--Light amounts of stripe rust were found scattered from north-central Texas to southern Minnesota and east-central North Dakota. The hot weather and cultivar resistance of the commercial hard red spring and winter wheats are the two deterrents for extensive stripe rust development in the Great Plains. In the Pacific Northwest stripe rust was severe on susceptible cultivars, but the commonly grown cultivars with high-temperature, adult-plant resistance were not severely rusted.

Oat stem rust--In 1982, oat stem rust was light and not scattered as extensively as in previous years throughout Texas. This area provided inoculum for the northern oat growing area where rust was found in most fields, but generally only in light amounts. Infection occurred in late May and covered only eastern Minnesota. Dry conditions in June and July retarded development from these infections. The second exogenous input of inoculum occurred at the end of June and covered the western part of Minnesota and the eastern Dakotas. This heavy initial infection was too late to damage the crop even though favorable conditions prevailed in most of this area. Oat stem rust losses in the northern oat growing area will occur only in the late maturing fields.

Table 3. Preliminary data of the 1982 oat stem rust race survey (8/3/82).

Location	No. of collections	Percent of isolates of each race			
		NA-5	NA-16	NA-23	NA-27
Alabama	1		100		
Arkansas	1				100
Iowa	2				100
Kansas	1				100
Louisiana	2	50			50
Texas	175	2	5	1	92
1982	182	3	5	1	91
1981 (final)	555	1	3		95
1980 (final)	434	9	11		78

Oat crown rust--In 1982, oat crown rust was severe throughout Texas causing losses in the most severely infected cultivars. In Iowa, severe crown rust developed and losses occurred statewide. In northwestern Minnesota, losses to crown rust will occur in late maturing fields. As in previous years, aecial development was heavy on buckthorns in the upper midwest providing heavy local inoculum sources. In the state of New York, crown rust was severe nearly statewide (Bergstrom).

Barley stem rust--Stem rust on barley was light in 1982 throughout the U.S. Scattered small to moderate-size uredia were found on plants in North Dakota and Minnesota fields and nursery plots.

Barley leaf rust--Barley leaf rust was nearly absent in the winter barley growing area of the southern U.S. Except for some central South Dakota fields and a few late maturing fields in northeast North Dakota losses were much lighter than last year in the Northern Great Plains. Leaf rust was common in nurseries in the mid-Atlantic Coast States.

Rye stem rust--In 1982, traces of rye stem rust were found in Georgia, West Virginia, North Dakota and Minnesota nurseries.

Rye leaf rust--Leaf rust severities were light to moderate throughout most of the U.S. rye growing area. In general, losses were light and localized.

Barberry rust--Aecial collections were made in West Virginia, Minnesota, and Ontario, Canada. The majority of the aecial collections were identified as Puccinia graminis f. sp. secalis, although Puccinia graminis f. sp. avenae and tritici were also identified in 1982.