CEREAL RUST BULLETIN

Report No: 1
April 13, 1983

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 of the fall planted small grains are 1-2 weeks behind normal development and in fair to good condition across the southern United States. Excessive moisture in the Southeast and South Central has flooded low areas and has delayed topdressing and spraying for insects and diseases. In the central and northern U.S. wheat growing areas, the winter was mild with adequate snow cover. Spring seeding of oats and barley is more than halfway completed in the Central Plains, but in the Northern Plains initial planting has not started.

Wheat stem rust--Stem rust was found in McNair 701 trap plots at Victoria and Beeville, Texas, on March 19. The Victoria plot planted in late October had severities of 10-80 percent while at Beeville only scattered pustules were found on the leaves of a January planting. These are the only reports of wheat stem rust in the United States at the present time. No wheat rust has been reported in Mexico except in the nursery at C. Obregon, Sonora, that had been artificially inoculated. No stem rust was observed on susceptible plots of wheat in northeastern Mexico.

Wheat leaf rust--Leaf rust is more severe in the wheat growing states that border the south Atlantic coast this year than in 1982. The rust increased last fall on volunteer and early planted wheat where it then overwintered. Currently the most severe leaf rust was found in nurseries but as increase in temperatures occurs leaf rust will increase in fields of susceptible cultivars. The initial two leaf rust collections this growing season from South Carolina were made in mid-December and the leaf rust races were identified as UN-2 (virulent on Lr3a and 10) and UN-3 (virulent on 2c, 3a, 3b, 9, and 18). In 1982 these 2 races comprised 64% of the isolates identified from this area. Race UN-13 (virulent on Lr1, 2a, 2c, 3a, 10, 17, and 18) was identified from a collection made in the Florida panhandle in mid-February. In 1982, this race comprised 2% of the races identified in the southern soft red winter wheat area. If this race becomes more prevalent and increases at a fast pace, it may cause a loss in some of the previously resistant cultivars.

Wheat leaf rust is light in most of the Gulf Coast area of the United States, from Texas to Georgia. This is in contrast to 1982 where final leaf rust losses ranged from 5-20% throughout the area. Leaf rust is light in commercial fields in south Texas, but on many susceptible cultivars growing in nurseries severities are high. The first leaf rust race identified from Texas in the 1983 crop season was UN-5 (virulent on Lr1, 3a, and 10), from a collection made in late fall in north Texas.

Leaf rust was found scattered throughout Kansas on volunteer wheat and tillering wheat in the fall of 1982. The races identified from these collections were UN-5 (virulent on Lr1, 3a, and 10). This race comprised 40% of the races identified in this area in 1982. On March 4, leaf rust was found in southern Kansas fields. This is the earliest this disease has been observed since systematic plant disease surveys were begun in 1975 (Sims).

Wheat stripe rust--Stripe rust was light in winter wheat nurseries at College Station and Gibbings, and severe in nurseries at Uvalde and Dallas, Texas. Stripe rust was absent at San Antonio and Beeville, Texas and Rio Bravo, Mexico, nurseries. Traces were found in farmers' fields in these areas.

Oat stem rust--Stem rust was observed in two commercial fields in south Texas. The rust was heavy (50% severity - 100% prevalence), in a Hidalgo county field where early planted oats were used as a windbreak for a watermelon crop. But in the other field, only traces occurred. As of April 6, no stem rust was found in the Beeville, Texas nursery, which is unusual for this location. It is anticipated that oat stem rust will increase in south Texas before crop maturity in late May. One Avena fatua (wild oats) collection was made in a field near San Antonio, Texas.

Oat crown rust--Crown rust currently is present in only trace amounts throughout the southern U.S. No heavily infected fields were observed in south Texas which is unusual for that area.

Barley leaf rust--Leaf rust is severe in the Rio Bravo, Mexico, nursery, but present in only trace amounts in south Texas nurseries. Leaf rust is severe in some of the cultivars (i.e. Barsoy) growing in the mid-Atlantic state nurseries where it may have overwintered.

CEREAL RUST BULLETIN

Report No: 2
May 4, 1983

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

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

The major part of the winter cereal crop is in good condition, but cool weather is delaying maturity. Central Texas wheat and oats are currently two weeks behind normal maturity. Subsoil moisture is adequate in central Texas, but surface moisture is low. The seeding of spring cereals is generally late, and in the North Central States is about a week late.

Wheat stem rust--Stem rust was present in a few soft red winter wheat plots in the Tifton, Georgia, nursery during the last week in April (Morey, Cunfer). Traces are present in commercial fields. Stem rust is present in nurseries in central Texas and a single pustule was found in a commercial soft red winter wheat field near Chilton in central Texas. Early collections from Texas were races 15-TNM, virulent on Sr17, and 151-QFB.

Wheat leaf rust--In the southeastern and south central United States, leaf rust is heavy in nurseries and fields where susceptible cultivars (i.e., Coker 68-15 and McNair 1003) are grown. Most commercial fields are the more rust-resistant cultivars (i.e., Coker 762 and Fla 301). Cultivars with Lr9 resistance (i.e., Arthur 71 and Abe) have less rust this year, suggesting a shift in the leaf rust race pattern.

Leaf rust has been reported to overwinter in both Kentucky and Illinois (Nielson). This early leaf rust in these states may cause more losses from leaf rust than in recent years in this area of the country. Losses may also occur in the Pacific Northwest where leaf rust is widespread and increasing on susceptible cultivars. Little leaf rust was found in central and north central Texas last week. The cultivars Coker 68-15 and Sturdy were rust-free; whereas, in 1982 they were severely rusted.

Leaf rust races UN-5 (virulent to Lr1, 3a, and 10) and UN-17 (virulent to Lr2a, 2c, 3a, and 10) are the two most common races identified so far from south Texas collections. Races UN-5, UN-17, and UN-13 (virulent to Lr1, 2a, 2c, 3a, 10, 17, and 18) were identified from collections made in a nursery in northeastern Mexico.

Wheat stripe rust--The warm winter and cool spring has created conditions for severe rust to develop on susceptible cultivars throughout the state of Washington. Losses to stripe rust may be less than usual, however, because many farmers now grow resistant cultivars and spray for control (Line).

Stripe rust is widespread in central and north central Texas. In nurseries some lines were defoliated shortly after flowering. In commercial fields, soft red winter wheats are more severely affected than hard red winter wheats. Most soft wheat fields had at least traces of stripe rust last week, and the most severely affected fields had lost 30% of the flag leaf by flowering stage. Losses overall will be light but some growers could suffer yield reductions of 15 percent.

Oat stem rust--Stem rust was found throughout south Texas, in nurseries at San Antonio and Uvalde, and commercial fields around the Uvalde area (Erickson, McDaniel). Traces of rust are present in central Texas on wild oats. Races NA-27 and NA-16 were identified from south Texas collections.

Oat crown rust--In the southeastern United States, crown rust is severe on susceptible cultivars which comprise a small percentage of the acreage (i.e., Brooks, Walker). Cultivars that comprise the greatest share of the acreage are much more resistant, i.e., Coker 227, and Fla 501 (Morey, Barnett). Crown rust is lighter than normal in Texas and only recently has become common in south Texas. Only traces are present in central Texas.

Barley leaf rust--Leaf rust is severe on some cultivars in the Tifton, Georgia, nursery (Morey). Traces were observed in central Texas nurseries.

Rye leaf rust--Leaf rust is severe in nursery plots in the Florida Panhandle (Barnett) and south central North Carolina (Newton).

CEREAL RUST BULLETIN

Report No: 3
May 25, 1983

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 cereal crops are two weeks behind normal in the major wheat areas of the Great Plains. Moisture is adequate, and with an increase in temperatures the crop should develop rapidly. Some of the early grazed or mowed PIK acreage has considerable regrowth in southern Oklahoma and Texas. These fields could become a major source of inoculum for plant diseases and insects. Spring grain seeding appears virtually complete except for some far northern areas.

Wheat stem rust--During the last week in April, stem rust was severe in the wheat varietal plots at Beeville, Uvalde (Erickson), and San Antonio (McKone), Texas nurseries. In mid-May traces of stem rust were found in the McGregor and Dallas, Texas (Gardenhire) and Altus, and Stillwater, Oklahoma (Hunger) nurseries.

Stem rust overwintering foci were found in McNair 701 trap plots at Tifton, Georgia, and Crowley, Louisiana, nurseries. At both locations the rust pustules were approximately the same age, and severe rust was observed in other soft red winter wheat varietal plots in close proximity to the McNair 701. In Quincy, Florida (Barnett), Raymond, Mississippi, and St. Joseph, Louisiana, varietal plots stem rust was found but no overwintering foci were located.

Wheat leaf rust--Leaf rust severities on winter wheat cultivars growing in the southern U.S. are less than 1982. This appears due to 1) more leaf rust resistant cultivars planted, 2) low temperatures in the fall which restricted rust increase, and 3) apparent changes in the virulence of the leaf rust race population. Last year some of the commonly grown cultivars (i.e., Coker 68-15, Newton) had severe leaf rust, and losses occurred. This year the same cultivars have less leaf rust while some of the more resistant cultivars in 1982 (i.e., Hunter, TAM W-101) have more rust.

In the Oklahoma-Kansas area leaf rust was widespread but generally only in trace amounts. However, in the Lawton, Oklahoma, area 40% severities were reported on TAM W-101 flag leaves and 5-10% severities on TAM W-105 leaves. In north-central Kansas leaf rust prevalence was 100% on Eagle with trace severities.

In California (Jackson) and Virginia (Roane) nurseries leaf rust was widespread and severe on susceptible cultivars but was light in most commerical fields. However, there are exceptions (i.e., field of Yecora Rojo in Kings Co., California-60% severity).

Leaf rust is widespread and heavy in the Pacific Northwest and losses will occur if the weather continues cool and moist.

During the past two weeks, UN-5, (virulent to Lr 1, 3a, 10, and 24) and UN-17 (virulent to 2a, 2c, 3a, and 10) were identified from collections made in South Texas.

Wheat stripe rust--Stripe rust was present in trace amounts throughout southern Kansas and Oklahoma during mid-May. When the temperatures start to increase stripe rust development will cease and therefore losses will be light in most of the hard winter wheat area.

Throughout much of the Pacific Northwest and California stripe rust is severe on susceptible cultivars but in the commonly grown cultivars with adult-plant resistance rust is less severe. Losses will be heavy in some areas where adult-plant resistant cultivars were planted early (Line).

Oat stem rust--During the last two weeks traces of oat stem rust were found in varietal plots at Yolo, California (Jackson), Quincy, Florida (Barnett), Poplarville, Mississippi, and Vernon, Texas. During the same time period stem rust severities ranged from light to severe in cultivars in the Beeville (McDaniel) and San Antonio (McKone) nurseries.

Oat crown rust-In 1983 this rust only seems to be severe on specific cultivars (i.e., Brooks, Walken) in the southeastern U.S. These cultivars comprise a small part of the oat acreage. On May 16, the first pycnia were observed on buckthorn bushes in the St. Paul, Minnesota, nursery.

Barley stem rust--Traces of stem rust were found on barley growing in close proximity to the McNair 701 plot in the Tifton, Georgia, nursery.

Barley leaf rust--Leaf rust was abundant in the Warsaw, Virginia, nursery where it overwintered (Roane) and in commercial fields in the same area. Leaf rust was severe in many of the barley cultivars in southern California nurseries and fields (Jackson).

Rye leaf rust--Severities of 20-40% were common on flag leaves of rye growing throughout the southeastern U.S. during the first part of May. Rust was light to absent throughout the rest of the U.S.

Orchard grass stem rust--A stem rust collection was made from orchard grass (Dactylis glomerata) in Alcorn, Mississippi (Trevathan).

Other diseases--Powdery mildew is severe in south-central Oklahoma and north-central Texas in heavily fertilized fields of TAM W-101 and 105.

Tan spot is severe in south-central Kansas and northern Oklahoma.

Speckled leaf blotch is severe in north-central Oklahoma.

CEREAL RUST BULLETIN

Report No: 4
June 8, 1983

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 is commencing in the southern areas of the southeast and south central United States. The winter wheat crop ranges from good to excellent condition from north central Texas northward to southern South Dakota with maturity one to two weeks later than normal. Most of the spring sown small grain crop is planted, but growth has been slowed by cool temperatures and a lack of sunshine.

Wheat stem rust--Stem rust collections were made the past two weeks in nurseries at Griffin, Georgia (Cunfer); Chillicothe, Texas (Magnuson); Thrall, Texas (Erickson); and Manhattan, Kansas (Eversmeyer). The infection center at Manhattan was found in a plot of the susceptible cultivar McNair 701, and the rust either overwintered or the infection occurred very early (i.e., February). At Griffen, severities were trace to 1% at the milk growth stage in the Uniform Rust Nursery. At Thrall, the severities ranged from 5% (Coker 762) to 80% (TAM W-101) at hard dough growth stage. The amount of stem rust in the south could act as a source of inoculum for the northern crop. There is more inoculum than in recent years but less than in 1965, the last year of serious losses in the Central Great Plains. The important durum and spring wheat cultivars in the North Central States are resistant to current populations of stem rust.

Races identified from collections received prior to May 1 are as follows:

Location	Number of Collections	Wheat stem rust CRL races (No. of isolates)
South Texas	6	TNM(6), QCB(11), QFB(1)
Central Texas	3	TNM(5), QFB(1), HNL(1)
Georgia	3	TNM(9)

Wheat leaf rust--Leaf rust severities are light in the wheat growing areas of northeast and central Arkansas but losses could occur in some late planted fields (Bassi). Throughout the entire Mississippi River Flood Plain wheat area the leaf rust has been much less than last year. In Georgia, leaf rust was severe on some of the common cultivars (i.e., Coker 747, McNair 1813, Stacy) but less severe on other cultivars (Coker 68-15 and Arthur 71) than in 1982 (Cunfer). Leaf rust severities ranged from 40% in the Clemson, South Carolina (Graham) nursery to traces in West Virginia (Williams) fields during the last week in May.

In Kansas, the cool, moist weather which slowed wheat development has allowed leaf rust to build rapidly throughout the state. During the first week in June traces of leaf rust were found on susceptible winter wheat cultivars in Fargo, North Dakota, (Statler) and Rosemount, Minnesota, nurseries. These are normal dates for the earliest leaf rust observations in this area.

Five different leaf rust race combinations were identified from the first collections made in the southeastern U.S. in 1983. Race UN-2 (virulent to Lr3a); UN-2 (virulent to Lr3a, 10), UN-3 (virulent to Lr2c, 3a, 3b, 9); UN-6 (virulent to Lr1, 2c, 3a, 10, 17, 18); and UN-14 (virulent to Lr1, 2c, 10). Since the number of identified collections is yet small (16) it is not possible to determine whether there are fewer leaf rust virulence combinations than 1982.

Four leaf rust race combinations were identified from collections made in south Texas. UN-2 (virulent to Lr3a, 10); UN-2 (virulent to Lr2a, 10, 24); UN-5 (virulent to Lr1, 3a, and 10); and UN-17 (virulent to Lr2a, 2c, 3a, and 10).

Wheat stripe rust--Stripe rust is scattered throughout central and northern Kansas but should cause little loss. In Arkansas, the disease became severe in the southeast but is not a problem in the northeast. Losses of 10-15 percent may occur in dry land fields of Moro, Jacmar, and Tyee in Adams County of eastern Washington.

Oat stem rust--During the past two weeks stem rust was found in the nursery at Dallas, Texas, (Gardenhire). Races identified from collections received prior to May 1 are as follows:

Location	Number of Collections	Oat stem rust NA races (No. of isolates)
South Texas (oats)	11	NA-27(32) NA-16(1)
South Texas (wild oats)	1	NA-27(3)

Oat crown rust--The rainy, cool weather has delayed the aeciospore development in the buckthorn nursery at St. Paul, Minnesota. No crown rust has been reported in commercial spring planted oat fields.

Barley leaf rust--In the past two weeks moderate leaf rust was observed in Martinsburg, West Virginia, (Williams) and Elizabethville, Pennsylvania, (Bingaman) fields, and the Stillwater, Oklahoma, (Hunger) nursery.

Rye leaf rust--Rye leaf rust was found in West Virginia and Wisconsin fields in trace amounts.

Triticales leaf rust--Moderate leaf rust (20% severity) was observed on triticales in Plains, Georgia, (Cunfer) and Brooks, Oregon, (Jenkins) during the last week in May.

Barberry rust--Barberry bushes are heavily infected with aecia in Oconto County, Wisconsin, which could provide inoculum to infect small grains within the immediate vicinity.

If you have any information that would be of interest for addition to the Cereal Rust Bulletin, would you please call me at (612) 373-1439 or write to the Cereal Rust Laboratory, USDA-ARS, University of Minnesota, St. Paul, MN 55108. Thank you.

David Long

CEREAL RUST BULLETIN

Report No: 5
June 21, 1983

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

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

The winter wheat crop in the central Great Plains is 1-2 weeks behind normal maturity. Most of the area has good moisture, and crops would benefit from more normal temperatures. Most of the spring sown grains are also one week late.

Wheat stem rust--Stem rust was observed in trace amounts throughout northwest Kansas in commercial fields and nurseries during the week of June 13-17. Most of the crop was in the berry stage which is two weeks later than normal maturity. Trace losses to stem rust may occur in a few of the late maturity fields of susceptible cultivars. The identification of these cultivars is not known at the present time. At the Colby, Kansas, experiment station, stem, leaf, and stripe rust infections of the same age were found on the flag leaf which suggested that a rain shower deposited the spores of all three rusts simultaneously. The stem rust in Kansas could be a source of inoculum for the northern crop, however. The important northern cultivars are resistant to the current stem rust population. In the Belleville, Kansas, Experiment Station varietal plots, traces of stem rust were found on one experimental plot on June 13.

Farther north, in central South Dakota, traces of stem rust were found June 16 in the Highmore, South Dakota, nursery on the winter wheat cultivar Buckskin. At Brookings, on June 16, traces of stem rust were found on the spring wheat cultivar Chris. These infections were about 10 days old. These are the first stem rust uredia found in this area and they are 14 days earlier than the 10 year average (1971-1980) for South Dakota.

Since the last bulletin, race 15-TNM, avirulent on Sr 17, was identified from collections made in Louisiana and Georgia, 11-RCR from Florida, and 151-QFB and 113-RTQ from Texas.

Wheat leaf rust--Leaf rust is widespread and increasing in northern Kansas fields and varietal plots. The later than normal crop maturity will allow an additional increase in leaf rust but losses will be much less than in 1982. In Kansas, rust was present in late winter but it did not rapidly increase early in the spring probably because of cool temperatures. Traces of leaf rust were found in commercial winter wheat fields and plots in southern Nebraska and in plots in eastern South Dakota in mid-June. Traces of leaf rust were found in spring wheat plots at Rosemount, Minnesota, on June 16 (Wilcoxson).

In the Pacific Northwest as the temeratures have increased the leaf rust severities have increased. Some farmers have sprayed with Bayleton which will control both leaf and stripe rust (Line). In most of the northern soft red winter wheat areas, leaf rust is light except for a few isolated fields in Illinois. This is less rust than at this time last year which may be due to cooler weather and less inoculum generated farther south.

Preliminary data from the epidemiological virulence survey of wheat leaf rust collections received prior to May 6, 1983 are as follows:

Race and virulence	No. of isolates per state					Total
	Alabama	Florida	Georgia	S. Carolina	Texas	
UN-2						
Lr3a	1		3		3	7
3a,10	3		1		11	15
UN-3						
2c,3a,3b,9	12	2	1		5	20
2c,3a,3b,9,18					5	5
UN-5						
1,3a,10					47	47
1,3a,10,24					8	8
UN-6						
1,2c,3a,3b,9,18			1	3		4
1,2c,3a,10,17,18		4				4
UN-13						
1,2a,2c,3a,10,17	2	2			2	6
UN-14						
1,2c,10	10		2			12
UN-17						
2a,2c,3a,10					11	11
Totals	28	8	8	3	92	131

Stripe rust--Trace amounts of stripe rust are common in fields and plots throughout northern Kansas and southern Nebraska. Moisture has been plentiful, temperatures were cooler than normal, and inoculum was present. This combination has allowed the disease to develop on many of the commonly grown cultivars. Slight differences in stripe rust resistance were noted in northwest Kansas varietal plots. The amount of loss due to stripe rust in this area will depend on how much longer the temperatures stay cool; however, losses will be light.

In the Pacific Northwest stripe rust is severe in local areas. Adult plant resistances are still adequate (i.e., Stephens, Wanser and Daws).

In Cereal Rust Bulletin #4, it was stated that stripe rust will cause a loss on certain cultivars including Tyee. Tyee is resistant to stripe rust and should be removed from that list.

Oat stem rust--Collections from California were identified as NA-5, and those from Texas were NA-27 and NA-16.

Oat crown rust--Crown rust on buckthorn in central Iowa is heavier than usual this year (Simons). Buckthorn is heavily infected in nonagricultural land in east central Minnesota and west central Wisconsin. It is assumed this rust will be virulent on Poa spp., but not oats.

Barley stem rust--Wheat race 15-TNM was identified from stem rust collections made from barley in Georgia.

Barley leaf rust--Leaf rust was reported in Kansas last week.

Rye leaf rust--Rye leaf rust was found in plots at the Rosemount, Minnesota, Experiment Station on June 16 (Pretorius).

Barberry rust--Stem rust aecial collections were made in Fillmore County, Minnesota (Schlick) and Monroe County, West Virginia (Bostic) in the past two weeks.

CEREAL RUST BULLETIN

Report No: 6
July 12, 1983

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

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

Above-normal temperatures accelerated winter wheat development throughout the central and northern plains during the past two weeks. Hard red winter wheat harvest is now in full swing except in the northern states.

Harvest of soft red winter wheat is now into Illinois and Indiana and generally is one week behind normal. Development of the northern spring small grain crop advanced very rapidly the past two weeks, and maturity is near normal.

Wheat stem rust--Rust was found scattered throughout eastern and northeastern Kansas fields in trace amounts during mid-June (Willis). During the same time period rust was collected in hard red winter wheat nurseries in Stillwater, Oklahoma (Hunger), Pratt and Colwich, Kansas (Diehl), and Casselton and Fargo, North Dakota (Miller). At Clay Center, Nebraska, stem rust severely damaged the most susceptible cultivars and lines (Schmidt, Doupnik). Stem rust collections were also obtained on soft red winter wheat entries at Foreman, Arkansas (Bassi), Lafayette, Indiana (Cisar), St. Joseph (Newton) and Champaign, Illinois (Vian, Jedlinski) nurseries during the last 2 weeks in June. A 40% stem rust severity was read on the winter wheat cultivar McNair 701 at Rosemount, Minnesota, the first week in July. Stem rust was found in winter wheat fields in Walworth County, Wisconsin, on July 6th (Norgren) and Ransom County, North Dakota (Miller).

During the last week in June, traces of stem rust were found in spring wheat nurseries at Staples, Minnesota; Fargo, North Dakota (Miller); and Brookings, South Dakota (Cholick). Severities of 2 to 5% now exist on susceptible cultivars in plots from Waseca, Minnesota, to Brookings. These initial infections were from spores deposited with rain 2-3 weeks earlier. As of July 11, 1983, wheat stem rust is scattered much more widely throughout the U.S. than in any of the previous five years. Rust is more prevalent this year because of delayed winter wheat maturity and above normal precipitation. In most of those locations where rust is found, losses will be minimal except in the few cases where susceptible cultivars will mature late.

Race TNM-15 is the most commonly identified race so far throughout the U.S. (Table 1). In the southeastern U.S., race TNM-15 has replaced race QFB-151 which predominated for the past 5 years.

Table 1. Preliminary data from the 1983 wheat stem rust race survey (7-8-83)

Location	No. of Collections	Wheat Stem Rust CRL Races (No. of Isolates)
S. Texas	39	TNM(55), QCB(33), RTQ(6), QFB(3), HNL(1)
N. Texas	5	TNM(15)
Oklahoma	2	TNM(6)
Louisiana	6	TNM(18)
Mississippi	2	TNM(6)
Georgia	6	TNM(18)
Florida	3	RCR(9)

Wheat leaf rust--Leaf rust is severe on susceptible cultivars (i.e., Hart, Tyler, McNair 1003) throughout the northern soft red winter wheat area. In some cases, i.e., southwestern Illinois, 10-20% yield losses are expected (Jacobsen).

By mid-June, wheat leaf rust had devastated fields of susceptible cultivars such as Tyler, Massey, and McNair 1003 in eastern Virginia. Apparently, rust overwintered at high levels during the mild winter. In western Virginia yield trial nurseries, rust was severe on susceptible cultivars, while 100 feet away no rust was found.

Leaf rust increased in Nebraska and South Dakota winter wheat fields during the past two weeks, but with the fast development of the crop only trace losses are expected. Rust is generally light in commercial spring wheat fields in the upper Great Plains, due to resistant cultivars. Because of the fast developing crop maturity, rust will not be a major problem even on susceptible cultivars.

In the Pacific Northwest, leaf rust developed late but with continued good moisture, severities will be high. In some of the late planted areas (i.e., Palouse) winter wheat losses will be 10-15% (Line).

In California, leaf rust was more severe than during any other of the last 20 years. On the dominant cultivar, Yecora Rojo, rust was severe, but the disease developed late in the season and losses are not expected to be great (Qualset).

Table 2. Preliminary data of the 1983 wheat leaf rust epidemiological virulence survey.

Race and Virulence	No. of isolates											
	AL	AR	CA	FL	GA	KS	LA	MS	IL	SC	TX	Total
UN-2												
Lr 3a	1				3		1	5			6	16
3a,10	2	2	2		1		2	1	1	4	7	22
UN-3												
2c,3a,3b,9	14		1	1	4			1			4	25
2c,3a,3b,9,18	2			1						2	1	6
UN-5												
1,3a,10		3	3			7	2	3	4	1	58	81
1,3a,10,24						1					9	10
UN-6												
1,2c,3a,3b,9,18										8		8
1,2c,3a,10,17,18		2		4						1		7
UN-13												
1,2a,2c,3a,10,17	2			2							2	6
UN-14												
1,2c,10	10				2			1				13
UN-17												
2a,2c,3a,10							1				20	21
Total	31	7	6	8	10	8	6	11	5	16	107	215

Stripe rust--In the central and northern Great Plains, temperatures have warmed and stripe rust development has been retarded. No new observations have been reported in this area during the past two weeks. However, in the past two weeks, stripe rust has increased greatly in the Pacific Northwest. The newest race in this area attacks Moro and cultivars of similar resistance. This race is present throughout the Pacific Northwest. The most prevalent races are those that attack Fielder (Line).

Oat stem rust--In the past two weeks, oat stem collections were made in College Station, Texas (McDaniel), Richland, Indiana (Vian), Columbia, Missouri (Sechler), and Urbana, Illinois (Jedlinski). At St. Paul, Minnesota, natural infection occurred the third week in June. Stem rust is now found at a trace severity and 50% prevalence across southern Minnesota and into eastern South Dakota.

In California, stem rust was severe in experimental plantings and widespread on wild oats (Qualset).

Oat crown rust--Crown rust is moderate on many of the cultivars in the nursery at Rosemount, Minnesota; and light amounts were found on wild oats as far north as Fargo, North Dakota (Miller). In commercial fields severities of 20% were common across southern Minnesota at the milk growth stage (July 10).

Barley leaf rust--In California leaf rust was moderate to heavy in Atlas and Cal Mor-derived cultivars and generally heavy in other cultivars (Qualset). No leaf rust has been reported in the north central states. Leaf rust was reported in Delaware on June 29 (Gallivan).

Table 3. Preliminary data from the 1983 barley leaf rust survey (7-12-83)

Races of Puccinia hordei in USA in 1983

Location	No. of		% of isolates of race				
	Collections	Isolates	4	8	13	19	30
Obregon, Mexico[1/]	25	32				100	
California	12	13		8	8	54	30
Georgia	2	2		100			
Maryland	2	2	100				
Oklahoma	3	3		100			
Virginia	3	3	100				
West Virginia	1	1	100				

[1/] Inoculated

Rye leaf rust--Rye leaf rust was found in fields and nurseries throughout Minnesota, Pennsylvania, and Virginia in the past two weeks, generally in light amounts.

Rye stem rust--Light amounts of rust were found on nearly mature rye fields in Summers and Monroe Counties of West Virginia (Bostic). The fields were adjacent to barberry bushes. No stem rust has been found on rye in the north central states.

Wild barley stem rust--Traces of stem rust were found on wild barley growing in southeastern North Dakota (Miller) and across southern Minnesota.

Barberry rust--Aecial collections were submitted from Ontario, Canada (Clark) and Wolf Creek, West Virginia (Bostic).

CEREAL RUST BULLETIN

Report No: 7
July 26, 1983

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

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

The small grain crop in much of the upper Great Plains is in good condition. The winter wheat, early oats and barley harvests are beginning in Minnesota, Michigan and the Dakotas.

Wheat stem rust--In the past two weeks wheat stem rust was found on susceptible wheat cultivars in nursery plots and fields in the northern United States from central Michigan to northern North Dakota. In the winter wheat fields generally only trace severities were found and in the nurseries, 20% severities were common on susceptible spring wheat cultivars. The most likely explanation for this wide coverage of stem rust in the U.S. appears to be that a large storm system in late May deposited spores from the deep south over the central and northern Great Plains. The source area has not been clearly identified. A step-wise progression appears less likely on the basis of the area affected and timing of appearance. Even though this is the largest area covered by stem rust in many years, losses will be light except in some of the latest planted susceptible cultivars. Most spring cultivars are resistant, and the resistance continues to be effective.

Preliminary data from the 1983 wheat stem rust race survey (7-25-83).

Location	No. of Collections	Wheat Stem Rust CRL Races (No. of Isolates)
S. Texas	39	TNM(55), QCB(33), RTQ(6), QFB(3), HNL(1)
N. Texas	6	TNM(18)
Oklahoma	9	TNM(27)
Louisiana	6	TNM(18)
Mississippi	2	TNM(6)
Georgia	9	TNM(21), RKQ(2), QFB(2), PTQ(2)
Florida	3	RCR(9)
California	1	TNM(3)

Wheat leaf rust--Leaf rust is light in Minnesota and North Dakota spring wheat fields. On susceptible cultivars growing in nursery plots severities are lighter than last year and only trace losses are expected in the susceptible commercial fields. The light leaf rust in 1983 in the Upper Midwest may be due to the fact that there were few southern locations that could have provided large amounts of inoculum to the area. There were only two known areas (upper mid-Atlantic states and southwestern Illinois) that had significant leaf rust epidemics. Whether they provided any inoculum for further north locations is debatable. Since the last bulletin, there have been no new significant additions to the wheat leaf rust virulence survey table.

Oat stem rust--During mid-July traces of oat stem rust were found in oat fields in west and central Minnesota and the eastern areas of the Dakotas. Throughout the Upper Midwest in nursery plots of the most susceptible cultivars, severities reached 20% (i.e., north-central Iowa, Simons and Michel). So far in 1983, oat stem rust is lighter than normal but with continued favorable climatic conditions for spore production and infection, rust will become more severe and losses will occur in some later maturing fields. Traces of stem rust were found on a few wild oats (Avena fatua) plants in western Minnesota and eastern South Dakota during mid-July. The number of plants (prevalence) infected was less than in previous years.

Oat crown rust--Crown rust is light in the Upper Midwest this year except for some fields in southern Minnesota and fields in close proximity to buckthorn bushes. Also in New York the crown rust severities are very light when compared to the major epidemics of the previous two years (Bergstrom).

Barley leaf rust--Leaf rust is generally light but widespread in the north-central states. The crop is maturing fast and any losses will be minimal.

Barley stem rust--Barley stem rust can be found very easily in commercial fields in the north-central states. In most instances only trace amounts were found, but in later maturing barleys 5% severities were seen. On the susceptible cultivar Hypana, severities as high as 20% were observed in southwest Minnesota nursery plots. As with wheat, this is the most barley stem rust that has been observed for many years. During mid-July severe stem rust was found on wild barley (Hordeum jubatum) in northeastern Missouri, central Iowa, eastern South Dakota, and west-central Minnesota.

Rye leaf rust--In the north-central states, twenty percent rye leaf rust severities are common on green leaves.

Rye stem rust--In the past two weeks rye stem rust collections were made in southern West Virginia (Bostic) and central Minnesota.

Barberry rust--The barberry collections from West Virginia yielded two races that were not previously identified in the U.S. The wheat stem race TNB is a race 15, avirulent on Sr 36 (Tt-1) and an oat stem rust race that is virulent on Pg-3, 9, and 15.

CEREAL RUST BULLETIN

FINAL ISSUE
August 9, 1983

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

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U. S. DEPARTMENT OF AGRICULTURE
(In cooperation with the Minnesota Agricultural Experiment Station)

Throughout the northern grain growing region, the warm temperatures have hastened small grain development. In the Northern Great Plains region much of the spring sown grains have been harvested or are mature.

Wheat stem rust--Stem rust is severe in susceptible spring wheat and late maturing winter wheat cultivars from northwestern Minnesota to central North Dakota. However, in the commercial wheat fields rust was limited to highly to moderately resistant infections since the northern cultivars are resistant to the current stem rust populations. Stem rust was also prevalent throughout the Pacific Northwest but arrived too late to cause any significant damage.

In summary, in 1983 stem rust was first found March 19 in McNair 701 trap plots in south Texas. Other stem rust overwintering foci were found in southern Louisiana and southern Georgia plots. By mid-May traces of stem rust were found in northern Texas, central Oklahoma, and northeastern Kansas. Then a large storm moved from the South over the central and northern Great Plains and deposited spores over the entire area in late May. The delayed crop development and weather conditions were conducive for the initial development and spread of the disease in susceptible cultivars. Even though this was the largest area covered by stem rust in many years, losses were insignificant because of the near universal use of resistance.

As shown in Table 1 no new different stem rust races have been found in 1983. The stem rust race 15-TNM is the most common race identified from collections prior to 8/5/83, and this race has been the most prevalent race since the 1970's. The most significant difference about the 1983 preliminary data is that no 151-OSH isolates were found, while in 1982 this race comprised 3% of the identified isolates.

Table 1. Preliminary data from the 1983 wheat stem rust survey (8-5-83).

		*Percent of isolates of each race						
		11	15	17	113		151	
State	No. of Collections	RCR	TNM	HML	PKQ	RTQ	QCB	QFB
Arkansas	1		100					
California	1		100					
Florida	3	100						
Georgia	9		78		7	7		7
Illinois	2		100					
Kansas	20		100					
Louisiana	6		100					
Mississippi	2		100					
Oklahoma	9		100					
South Dakota	2		100					
S. Texas	39		56	1		6	34	3
N. Texas	6		100					
1983	100	3	79	*	1	3	12	2
1982 (Final)	109	*	79	1	4	*	3	5
1981 (Final)	195	5	36	4	1	1	1	37

* Less than 0.6%

Table 1 suggests a distinct population in Florida (based on three collections), and some diversity in the overwintering areas of south Texas and Georgia. Otherwise, the identifications so far in 1983 represent a population only of race 15-TNM. This is virulent to Sr genes 5, 7b, 8, 9d, 9e, 10, 11, 16, 36, Tmp and avirulent to genes 6, 9a, 9b, 13, 15. About 80% of the isolates are virulent to Sr 17 and the remainder avirulent, which is about the same as in 1982.

Of the more widely grown cultivars for which the genetics of resistance is known, Era spring wheat is known to possess at least Sr 5, 6, 12, and 17, and Centurk winter wheat has Sr 5, 6, 8, 9a, and 17. This sort of information is not fully known for many of the important cultivars.

Wheat leaf rust--In 1983 wheat leaf rust generally was lighter than 1982 in most U.S. locations. A few exceptions to this were the mid-Atlantic states and southwestern Illinois where there were significant leaf rust losses. The less leaf rust than normal in southern U.S. was due to 1) more leaf rust resistant cultivars planted, 2) low temperatures in the field which restricted rust increase, and 3) changes in the virulence of the leaf rust race population (Table 2).

In Kansas, the cool, moist weather in May and early June which slowed wheat development allowed leaf rust to build rapidly throughout the state. Losses were heaviest in the latest maturing fields. By the end of June, the hot temperatures had pushed crop development and made conditions less favorable for rust increase farther north. In the spring wheat area leaf rust was very light because most of the cultivars are resistant.

In California, leaf rust was more severe than during any of the last 20 years. However, the disease developed late, so losses were light. In the Pacific Northwest, leaf rust developed late but with continued good moisture losses were severe in some late planted areas.

The data shown in Table 2 are generally from the southern states. The most common race was UN-5 (virulent to Lr 1, 3a, 10). The next three most common races were UN-3 (virulent to Lr 2c, 3a, 3b, 9), UN-17 (virulent to 2a, 2c, 3a, 10) and UN-2 (virulent to 3a, 10). The significant change from 1982 was the decrease in Lr 9 virulence (i.e., UN-3 race). In 1982 this race accounted for much of the severe leaf rust losses in the soft winter wheat area. No other major shift in virulence combinations have been noted in 1983.

Almost the total population is now virulent to Lr 3. The only exceptions were 13 isolates of UN-14 from Alabama, Georgia, and Mississippi. Much of the population is also virulent to Lr 10. No isolates were virulent to Lr 19 and only 14 (mostly from Texas) virulent to Lr 24 (UN-5). Virulence to Lr 2a is also relatively rare in these more southerly collections, except in Texas. As usual, the combination of virulence to Lr 1 and Lr 2a is rare (six isolates of UN-13). The leaf rust population continues to be much more diverse in virulence than the stem rust population.

Wheat stripe rust--Stripe rust was widespread in central and north-central Texas by the end of April. By mid-May traces of stripe rust were found scattered throughout Arkansas, Oklahoma, and southern Kansas. In early June stripe rust was common in field plots throughout northern Kansas and southern Nebraska. Moisture was plentiful, temperatures were cooler than normal, and inoculum was present. This combination allowed the disease to develop on many of the commonly grown cultivars but losses were light. Then in late June temperatures warmed and the stripe rust development was retarded from going north.

Table 2. Preliminary data from virulence survey of wheat leaf rust collections received prior to June 1, 1983.

Race and Virulence*	No. of isolates per state													
	AL	AK	CA	FL	GA	IL	KS	LA	MS	OK	PA	SC	TX	Total
UN-2														
Lr 3a	1				4			8	5				6	24
3a,10	3	2	2		1	1		3	1	5		4	8	31
3a,10,17,18											2			2
UN-3														
2c,3a,3b,9	15		1	1	8			3	1			4	4	37
2c,3a,9 18	2			1								2	1	6
UN-5														
1,3a,10		3	3		2	4	14	3	3	4		1	63	100
1,3a.10,24							1						13	14
UN-6														
1,2c,3a,3b,9,18												8		8
1,2c,3a,10,17,18		2		4		2					3	1		12
UN-13														
1,2a,2c,3a,10,17	2			2									2	6
UN-14														
1,2c,10	10				2				1					13
UN-17														
2a,2c,3a,10							1	1		4		1	28	35
Total	33	7	6	8	17	7	16	18	11	13	5	21	125	288

* The Lr single gene differentials tested in leaf rust race identification were 1, 2a, 2c, 3a, 3b, 9, 10, 16, 17, 18, 19, and 24.

In the Pacific Northwest stripe rust was severe in club wheats with Moro-type resistance due to a new rust race. Losses to stripe rust were less than usual because farmers grew more resistant cultivars and some sprayed for control.

Oat stem rust--In 1983, oat stem rust was lighter than normal in south Texas. The inoculum from south Texas was not detected in the northern spring oat growing area until early July which is one week later than normal. Because of the light infection, rust was not severe in July and was further limited in late July by the hot temperatures. Therefore, losses were light throughout the northern oat growing area. In general, the number of stem rust infections found on wild oats (Avena fatua) was less than in other years. Race NA-27 continues to dominate as in previous years.

Table 3. Preliminary data of the 1983 oat stem rust race survey (8/5/83).

Location	No. of Collections	Percent of isolates of each race		
		NA-5	NA-16	NA-27
South Texas	12		3	97
North Texas	33	9	5	86
1983	45	7	4	89
1982 (Final)	364	4	6	89
1981 (Final)	555	1	3	95

Oat crown rust--In 1983, oat crown rust was lighter than normal throughout the southern U.S. In the Upper Midwest crown rust was light except for some fields in southern Minnesota and central Iowa and fields in close proximity to buckthorn bushes. In these cases losses will occur but will be light.

Barley leaf rust--Leaf rust was severe in cultivars in the mid-Atlantic states and southern California where it overwintered. In the north-central states barley leaf rust was light but widespread; however, any losses were minimal.

Barley stem rust--The first report of barley stem rust in 1983 was from barley growing in close proximity to the susceptible wheat host McNair 701 in southern Georgia in late April. In mid-July barley stem rust was found easily in commercial fields throughout the northern Great Plains. Losses to barley stem rust were light. As with wheat, this is the most barley stem rust that has been observed for many years. Stem rust infections were found throughout the Northern Great Plains on wild barley (Hordeum jubatum).

Rye leaf rust--Rye leaf rust was moderate on flag leaves throughout the areas where rye is grown in the U.S. In general, losses were light and localized.

Barberry rust--Aecial collections were made in Minnesota, Wisconsin, West Virginia, and Ontario, Canada. As in previous years 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. Barberry collections from West Virginia yielded two races that were not previously identified in the U.S. The wheat race is 15-TNB, avirulent on Sr 10 and 36 (Tt-1), and the oat race is virulent on Pg 3, 9, and 15.