CEREAL RUST BULLETIN

Report No: 1
April 24, 1979

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)

Maturity of the winter grown cereals throughout most of the great plains is one to two weeks later than normal due to the cold winter. Wet soils and flooding is delaying planting in the upper midwest. Currently, planting is about one week later than normal and could be very late in the Red River Valley of the north due to severe flooding.

Wheat stem rust--Little stem rust has been observed. Trap plots of McNair 701 were severely rusted at Beeville, Texas on April 9, but no rust was observed on similar plots at Uvalde and San Antonio, Texas.

Wheat leaf rust--South of San Antonio, leaf rust was generally light on Nadadores 63, the primary commercial cultivar. However, on experimental lines in nurseries and on fields of some other cultivars, severities of 40-100% were common at the berry stage, and some losses will occur. No leaf rust has been observed in Oklahoma (Young) and Kansas (Eversmeyer). Leaf rust was moderately severe in Mexico's Yaqui Valley, but much less severe than in 1977.

Wheat stripe rust--Traces of stripe rust were found at Uvalde, Texas (Erickson) and at San Antonio. Recent warm temperatures should prevent its increase. No stripe rust has been observed this spring in Washington (Line). The use of the new stripe rust resistant cultivars, Daws and Stephens, should reduce the potential of epidemics in the Mount Vernon, Washington area.

Oat stem rust--Stem rust is widespread and moderately severe in commercial fields in south Texas. Most oats in this area are in the milk stage and losses will be moderate to heavy. Stem rust is rapidly increasing, and with recent rains it should continue to do so, producing vast quantities of inoculum.

Oat crown rust--Crown rust is light in most south Texas fields due to the use of resistant cultivars. Light amounts of rust are developing on TAM-O-312. Scattered fields of Ora, Nora, and Florida 501 are moderately to severely rusted. Overall losses in south Texas will be light, but the amount of inoculum produced will be greater than in recent years.

Barley leaf rust--Little barley is grown commercially in south Texas; however, a 120 acre field was killed by leaf rust in southern Frio County. Severities in plots in south Texas range from a trace to 100%.

The cereal rusts apparently did not overwinter north of San Antonio. Thus, inoculum arriving in the northern great plains will have to come from south Texas, Mexico, or perhaps Louisiana. The disease moving northward, based on data from previous years, probably will differ genetically from previous northern populations. The resistance provided by Lr9, 24, and the adult plant resistance of Era are often inadequate in south Texas. Due to the anticipated late planting of spring cereals in the northern great plains, wheat leaf rust, oat crown and stem rust, and barley leaf rust could become more severe than in recent years.

CEREAL RUST BULLETIN

Report No: 2
May 15, 1979

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)

Cold and wet weather last week further delayed planting in the upper midwest and generally, slowed crop development throughout the Great Plains. The small grain crop in north central Texas is probably the best in years.

Wheat stem rust--Overwintering centers of stem rust were located in northeast Louisiana (Winnsboro) and south central Georgia (Tifton) nurseries. In these nurseries, severities reached 80% on susceptible plots, and the disease had been present in the area for 4 or 5 generations. Although other similar plots were planted throughout the south, these are the only locations, plus Beeville, Texas, where we know that stem rust overwintered in the U.S. Traces of wheat stem rust were located in southwest Alabama commercial fields, but the crop was in the soft dough stage and the losses will be minimal. The first wheat stem rust collection of 1979 was made March 8, in the Beeville, Texas, nursery (Erickson) and the isolates were identified as 151-QFB. No stem rust has been reported in Texas commercial fields; however, it was found in trap plots at Temple, Texas where it has been at least a month. Stem rust collections were made in the Cd Obregon Nursery at Sonora, Mexico, and race 29-HJQ was identified.

Wheat leaf rust--Leaf rust is widespread and light to moderate throughout the southern states where moisture conditions and warm temperatures have been ideal for rust development. Severities ranged from 0-80% in the southern wheat variety nurseries. A few commercial fields in southeastern U.S. were recorded as 40% severity, but with the rapid development of the crop, losses will be minimal. In the southeastern states, leaf rust was severe on trap plots of McNair 701, which has Lr9 (Transfer) resistance. In the Arthur 71 type wheats, leaf rust was moderate and generally, more severe than last year. There is severe leaf rust on TAM-W-103 in the area between Abilene and Quanah, Texas. Severities on flag leaves varied from 60-80% in the milk stage. Leaf rust overwintered in this area and losses will be moderate; however, due to very favorable growing conditions, yields will still be greater than normal. Leaf rust was observed in Kansas for the first time this year during the first week in May.

Oat stem rust--The only oat stem rust found in the southeastern U.S. was low amounts in a nursery in Quincy, Florida, but this will increase with the proper weather conditions. The first stem rust collection this year was made in Beeville, Texas, nursery (McDaniel) and identified as race 76. Stem rust was found in nurseries as far north as College Station and McGregor, Texas, and in commercial fields in Concho, McCulloch, and San Saba counties. This is slightly less rust than present in this area in the past 2 years, but the crop is late and conditions are favorable for continued disease development. Collections of stem rust were made from *Avena fatua* in Sonora, Mexico and Sonora County, California fields (Moore). Isolates from an *A. fatua* collection made in Cd Obregon, Mexico, in late March, were identified as race 61.

Oat crown rust--Crown rust was observed in Alabama, Georgia, and Florida experimental plots. In these plots, rust severities ranged from trace to 80% on the different cultivars. Only traces of crown rust were observed in commercial oat fields. Trace amounts of crown rust occurred north as far as the Red River of Texas and Oklahoma. Severities in north central Texas are generally light but are the most severe since 1975. Crown rust will become severe on late maturing fields in north central Texas.

Barley leaf and stem rust--Leaf rust was light in commercial fields and heavy in some of the experimental plots in the southeast U.S. In spite of severe leaf rust in southern Texas, none was observed last week within north central Texas. Wheat stem rust isolates from a barley collection made at the Cd Obregon, Mexico nursery were identified as race 17-HNB.

Rye leaf rust--Traces of leaf rust were observed on experimental plots of rye in the southern states. In commercial fields mostly used for forage, little leaf rust was observed.

Triticale leaf rust--Leaf rust was found on some cultivars of triticales growing in experimental plots throughout the south, but generally in trace amounts.

Other diseases--Wheat: In the southeastern states Septoria nodorum (glume blotch) was severe in many of the cultivars grown in the nurseries and in some commercial fields. Losses will occur in some of these fields, but with the rapid development of the crop and drier weather, the losses will be light. Erysiphe graminis (powdery mildew) was heavy in some southern nurseries but light in commercial cultivars.

Oats: Septoria foliage blight was moderate in the southern states and a few local scattered areas of oat red leaf were also observed. Halo blight (Pseudomonas coronafaciens) of oats was more severe than in the past five years (Cunfer).

Barley: Barley yellow dwarf occurs in scattered areas throughout many of the southern nurseries and barley Helminthosporium stripe is heavy in some lines. Spot blotch is severe in many nurseries in north central Texas.

Loose smut of barley, wheat, and oats is heavier in the southern states than in previous years.

CEREAL RUST BULLETIN

Report No: 3
May 30, 1979

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)

In the spring wheat growing area of the U.S., planting remains two weeks behind normal, but with continued favorable weather, planting will progress rapidly. Oklahoma has prospects for its best wheat crop, and Kansas' prospects are good. Nebraska suffered some damage from winter killing, particularly in the western parts. A small area near Frederick, Oklahoma was probably killed by a freeze, and a narrow drought damaged strip exists in southern Rice and Barton counties in Kansas. Elsewhere, the winter wheat crop is generally rated good throughout the major production regions with harvest now occurring in south Texas and the southeastern states. Maturity of wheat in Kansas and Oklahoma is generally two weeks late, ranging from early dough in southern Oklahoma to heading in north central Kansas. Oat seeding was generally on schedule except for Minnesota, North Dakota, and Wisconsin. Moisture is no problem throughout most of the grain growing areas of the U.S.

Wheat stem rust--No stem rust has been reported north of Dallas, Texas. Isolates from stem rust collections made in the Cd. Obregon Nursery, Sonora, Mexico, in April were identified as races 17-HDL and -HNL. In the Beeville Nursery at Bee, Texas, races 17-HDC, 151-QFB, 113-RPQ, and -RTQ were identified.

Wheat leaf rust--Leaf rust is common across Oklahoma, Kansas, and southern Nebraska. Severities of 1% at flowering will be common throughout north central Kansas. Throughout most Oklahoma and Kansas, rains and heavy dews occurred daily last week. Thus, the potential for moderate to severe leaf rust with moderate losses exists in north central Kansas. Traces of leaf rust were reported in North Carolina (Newton), Rosemount, and St. Paul, Minnesota nurseries.

Wheat stripe rust--Traces of stripe rust were observed in the Pacific Northwest (Line). Stripe rust will not be severe this year in the Pacific Northwest. Stripe rust was found in California nurseries but none in the commercial fields.

Oat stem rust--In the past two weeks, oat stem rust was found in nurseries in Uvalde (Erickson) and Brazos (McDaniel) counties, Texas. Races identified from collections made April 11 in south Texas commercial fields were identified as races 1, 2, and 31 (NA 1, 5, and 27 - See Phytopathology 69:293-294).

Oat crown rust--No crown rust was observed in Oklahoma and Kansas last week. Currently at St. Paul, Minnesota, the aecial development on the buckthorn hedge is light. Free moisture has been present for basidiospore production but the nights have been too cool for good basidiospore germination.

Barley rusts--No leaf rust was found on winter barley in southern Kansas and Oklahoma last week.

Rye rusts--No leaf rust was observed on rye in Kansas or Oklahoma.

Barberry--The first barberry aecial collections of 1979 were made May 14 in Monroe County, West Virginia (Bostic) and Dane County, Wisconsin (Krueger and Leggett). This was the most stem rust infection on the barberries in Monroe County, West Virginia, in the last four years (Bostic). Seven more aecial collections were received from these two states in the last two weeks.

Other diseases--Powdery mildew, tan spot, and speckled leaf blotch are common foliar diseases across Kansas and Oklahoma.

CEREAL RUST BULLETIN

Report No: 4
June 12, 1979

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 improved weather in the northern Great Plain states has allowed spring grain seeding to proceed rapidly and near completion. The late seeding of small grains in the upper midwest has made the grain more vulnerable to disease, drought, weeds, and adverse harvest weather. Harvesting of winter wheat started last week in north central Texas which is two weeks later than normal. The winter wheat crop is in good to excellent shape and with good harvesting weather, above average yields are expected. Lack of moisture is not a major problem in most of the small grain growing areas of the U.S. at the present time.

Wheat stem rust--Traces of wheat stem rust were reported in northern Oklahoma and northern Texas in susceptible trap plots of McNair 701. The northward movement of wheat stem rust is the slowest it has been in the last ten years on this date. Preliminary data from the race survey are as follows:

		No. of isolates of each race																	
		11	15	17				29		113		151							
Area	No. of Collec.	RCM	TNM	HDC		HDL		HDM	HNL	HJC	HJQ	RPQ		RTQ		QCB		QFB	
Baldwin Co., AL	4	7								3									
Gadsen Co., FL	1					1			2										
Tift Co., GA	6															1		16	
Franklin Co., LA	2															6			
Bee Co., TX	8			1								1		3				4	
Uvalde Co., TX	3		1							3								5	
Cd Obregon, MX	6					1		1	4		9							3	

Wheat leaf rust--Leaf rust is severe in a few commercial fields in north Texas where 100% severities are present on TAM-W-103; normally severities reach only 40% (Johnson). In the last two weeks, leaf rust has increased little in northern Oklahoma and southern Kansas (Eversmeyer). No further increase in leaf rust is expected due to crop maturity. Traces of leaf rust were observed in Missouri (Foudin) Iowa (Williams), Washington (Line), and California (Qualset).

Wheat stripe rust--Stripe rust was observed in a Douglas County, Kansas field. This disease is unusual in Kansas except in years with cool springs. Stripe rust is scarce in the winter wheats in the Pacific Northwest, but some disease may occur in a few irrigated fields of susceptible spring wheats.

Oat stem rust--Rust development in the U.S. is less than in the previous two years on the same date, but, in general, this is offset by the later than normal crop maturity development. The northern most collection of oat stem rust was made in a commercial field west of Dallas, Texas (McDaniel). Preliminary data from the race survey are as follows:

Area	No. of Collec.	1 NA-1*	2 NA-5	31 NA-27	31 NA-29	61 NA-16	76 NA-3
Quincy, Florida	2			6			
Beeville, TX	24	7	4	45	11		3
Cd Obregon, MX (Avena fatua)	6		1	12		5	

*See Martens, et al. Phytopathology 69: 293-294

Oat crown rust--Traces of crown rust were observed in a plot in southern Kansas (Eversmeyer). Crown rust severity is moderate on the cultivar Wauken in plots in northern Texas (Gardenhire). Sporadic rains are creating conditions for continued pycnial infection from the germinating teliospores on the straw in the buckthorn nursery at St. Paul, Minnesota). The first aeciospore release was noted June 6th at the buckthorn nursery. Aecia also were observed on buckthorns in Iowa and Wisconsin.

Barley stem and leaf rusts--No reports of new disease development have been received in the past two weeks. A barley stem rust collection made in a Beeville, Texas nursery was identified as 17-HNL.

Rye stem and leaf rust--Rye stem and leaf rust infections were the heaviest in many years in a North Carolina nursery (Newton).

Barberry--In the past two weeks aecial collections were made from Berberis canadensis bushes in Monroe and Greenbrier counties, West Virginia (Bostic). This was the most stem rust infection observed on the B. canadensis bushes in the last 5 years in Monroe county, West Virginia. Aecial collections were made from Berberis vulgaris bushes in Jackson and Dubuque counties, Iowa (Larson); Dane and Jefferson counties, Wisconsin (Krueger, Leggett, and Bennett); and Fillimore county, Minnesota (Schlick, Schulz, and Laudon). The aecial infection is heavier than usual on barberries growing in the upper midwest because of extended cool moist conditions allowing for abundant and continued basidiospore production.

CEREAL RUST BULLETIN

Report No: 5
June 26, 1979

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 is near completion across the south and has started in eastern Kansas. Thus, the wheat harvest is 10-12 days behind normal. In the spring small grain region, warmer temperatures last week stimulated crop growth. Some moisture stress exists in Illinois and Indiana, and grasshoppers are severe in western South Dakota.

Wheat stem rust--Traces of stem rust exist in trap plots of McNair 701 as far north as Clay Center, Nebraska, and Norton, Kansas. Stem rust observations made in Oklahoma generally were one month later than normal. Few collections have been received at the Cereal Rust Lab. Early results from the race survey are as follows:

		No. of isolates of each race									
		11	15	17		29	113		151	
Area	No. of Collec.	RCM	TNM	HNL	HDL	HJC	RTQ	RPQ	QFB	QCB
Baldwin Co., AL	4	7				3				
Gadsen Co., FL	1			2	1					
Tift Co., GA	6								16	1
Franklin Co., LA	2									6
Bee Co., TX	8				1		3	1	4	
Bell Co., TX	1	3								
Uvalde Co., TX	3		1			3			5	
Cd Obregon, MX	6			4	2	9			3	

Wheat leaf rust--Traces of leaf rust were observed in Casselton, North Dakota experimental plots on June 12 (Miller). Traces of leaf rust are common on susceptible wheats in plots in southern Minnesota. Severities in commercial fields range from 10% in eastern Nebraska, up to 60% in north central Kansas, little increase will occur in the latter area.

Stripe rust--Stripe rust was found June 13, in northern Illinois (Jordan), and May 29, in central Oklahoma (Young). Traces were also reported in a nursery in Pratt, Kansas (Diehl). This is the first report of which we are aware of stripe rust occurrence in Illinois. Low levels of stripe rust are reported in the Pacific Northwest. Rust is starting to develop on spring wheat in the Pacific Northwest and the possibility of losses still exists if the weather is favorable for rust development.

Oat stem rust--Oat stem rust is present as far north as Belleville, Kansas. In a nursery at Belleville, traces are present on all cultivars. Preliminary data from the race survey are as follows:

Area	No. of Collec.	No. of isolates of each race						
		NA-1	NA-2	NA-3	NA-5	NA-7	NA-24	NA-27
Gadsen Co., FL	2							6
Attascosa Co., TX	1				1			2
Bee Co., TX	60	9	2	4	5	1		145
Bexar Co., TX	2							6
Brazos Co., TX	3							3
Concha Co., TX	1							
Frio Co., TX	1	2						1
LaSelle Co., TX	4							3
Live Oak Co., TX	1				3			
McLennan Co., TX	4	6					6	
San Saba Co., TX	1	3						

See Phytopathology 69:293-294

Oat crown rust--Crown rust has reached 100% prevalence on the most susceptible cultivars in east central Kansas (Sims). Severities in a nursery at Bereford, South Dakota are as high as 5%. Traces occur in southern Minnesota.

Barley leaf and stem rust--Barley leaf rust severely damaged the University of Missouri barley research plots (Foudin). No stem rust has been reported on barley outside of the deep south.

Rye leaf and stem rust--Leaf rust is light on winter rye. Stem rust had spread to Quackgrass from barberry in Brown County, Wisconsin by June 19.

Barberry--Stem rust aecial collections were made May 29, in Ontario, Canada (Clark).

CEREAL RUST BULLETIN

Report No: 6
July 10, 1979

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 wheat harvest is near completion in north Texas and in full swing throughout central and north Kansas. In most of the central Great Plains, the crop development remains considerably behind normal. The spring planted small grains are headed, but development is one week behind last year in most areas. Moisture problems are quite variable throughout the grain growing areas. In many instances, the topsoil moisture is depleted but there is enough subsoil moisture to suffice presently.

Wheat stem rust--Two weeks ago, traces of stem rust were observed in susceptible winter wheat trap plots in southwestern Nebraska and western Kansas. Traces of stem rust were found last week in central South Dakota winter wheat fields (Jon) and southern Minnesota trap plots of susceptible Baart. A rapid increase in stem rust during the past week indicates that conditions are favorable for disease increase where inoculum is available. Preliminary results from the race survey are as follows:

		No. of isolates of each race											
		11	15		17		29	113		151		
Area	No. of Collec.	RCM	TDM	TNM	HNL	HDL	HJC	RTQ	RPQ	QFB	QCB	QSH
Alabama	4	7					3					
Florida	1				2	1						
Georgia	6									16	1	
Louisiana	2										6	
Oklahoma	3		3	2		1						3
South Texas	11			1		1	3	3	1	9		
North Texas	2	3				3						
Cd Obregon, MX	6				4	2	9			3		

Wheat leaf rust--Leaf rust is moderate on winter wheats in Minnesota and South Dakota. Trace amounts of leaf rust are common in spring wheat fields, with 60% severities in some experimental wheat plots in southern Minnesota. Twenty percent leaf severities were reported on wheats growing in Ohio (Hite) and West Virginia (Bostic). There is a significant amount of leaf rust in south eastern Washington. The most severe rust has been in the irrigated fields, but with more rain rust could increase in the spring wheats (Line).

Stripe rust--Stripe rust is severe in the Willamette Valley of Oregon. However, the weather has been unfavorable for rust development in this area in the past two weeks.

Oat stem rust--Oat stem rust was first observed in an experimental plot in east central Minnesota on June 12. At this time, five pustules were observed on three leaves. These infections could have been a contaminant from our research facilities. This now appears unlikely as another center of a similar age was found in Scott County Minnesota (Laudon, Schulz) on June 26. A third center of similar age was found in Sibley County on July 6. Thus, a very early infection occurred (20 days earlier than normal), but in an amount nearly below the detection threshold. If the initial infection frequency had been near normal (one pustule per 40 foot of row) an epidemic would have occurred. Sufficient time remains with an environment favorable for disease increase for late-planted oats to become severely rusted. With the recent warm weather and morning dews, oat stem rust will increase rapidly in the next few weeks. Preliminary data from the race survey are as follows:

Area	No. of Collec.	No. of isolates of each race								
		NA-1*	NA-2	NA-3	NA-5	NA-7	NA-16	NA-24	NA-27	NA-29
Florida	2								6	
S. Texas	81	12	2	4	9	1	6		186	11
N. Texas	33	12						6	74	

*See Phytopathology 69:293-294

Oat crown rust--Crown rust is increasing in the oat experimental plots and commercial fields in the upper midwest. On the lower leaves the rust severities range from trace - 40% in the plots and trace - 10% in commercial fields. Due to the later than normal crop maturity, crown rust could cause losses in the later fields in the northern oat growing region. Traces of crown rust were found in a plot of the susceptible variety Marvellous in Franklin County, Ohio (Hite).

Barley leaf and stem rust--Two weeks ago, barley leaf rust severities were 10% at the Colby, northwest Kansas experiment station plots on plants in the soft dough stage. Traces of stem rust were present in the same plots.

Rye leaf and stem rust--Leaf rust is light on spring ryes in Minnesota and Wisconsin. Leaf rust was observed in West Virginia (Bostic) and Ohio (Hite) in moderate amounts. Traces of stem rust were found on rye in Scott and Olmsted Counties, Minnesota (Laudon and Schulz).

Other Grasses--Stem rust collections from Quackgrass (Agropyron repens) were made in Brown County, Wisconsin (Line) and Fillimore County, Minnesota (Laudon). A stem rust collection from wild barley (Hordeum Jubatum) was made in Fillimore County, Minnesota (Schulz). These collections were made within 100 yards of a barberry bush.

Barberry--In the last two weeks, aecial collections were made in Monroe County, West Virginia (Bostic), Goodhue and Fillimore Counties, Minnesota (Laudon), Brown and Waukesha Counties, Wisconsin (Line).

CEREAL RUST BULLETIN

Report No: 7
July 25, 1979

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 in northern Kansas and Colorado is near completion. Maturity and harvest is near normal in the Ohio Valley area, but remains behind normal in the Great Plains. Oat and barley harvesting has started in southern South Dakota and northern Iowa.

Wheat stem rust--Collections of wheat stem rust were made in commercial winter wheat fields of a single cultivar in Columbia County, Wisconsin (Saad). The rust severity in one of these fields was 20%. Traces of stem rust exist in wheat as far north as central Minnesota and southeastern North Dakota. No stem rust has been found west of the Missouri River in North Dakota. The wheat stem rust infection is the lightest in years and no significant losses are expected in the resistant spring or durum cultivars. No major shift has occurred in the physiological races identified thus far in the survey. Preliminary data from the race survey are as follows:

		No. of isolates of each race																
		11	15			17		29	113			151			56			
Area	No. of Collec.	RCM	TLM	TDM	TNM	HNL	HDL	HJC	RTQ	RPQ		QFB	QCB	QSH	MBC			
Alabama	4	7						3										
Florida	1					2	1											
Georgia	6											16	1					
Kansas	2				2							3			1			
Louisiana	2												6					
Oklahoma	4		2	3	2		1							3				
South Texas	11				1		1	3	3	1		9						
North Texas	5	3	2				3					1		5				
Cd Obregon, MX	6					4	2	9				3						

Wheat leaf rust--Final leaf rust severity readings of 60% were made in the Rosemount, Minnesota experiment station winter wheat cultivar plots. At Casselton, North Dakota, 70% severities were recorded on the winter wheat cultivar Eklund (Miller, Statler). Leaf rust is light throughout the upper midwest on commercial spring wheat cultivars. In spring wheat plots, severities as high as 5% were found on the cultivars Era, Waldron, and Olaf. On the less commonly grown cultivars, severities may reach 60%.

Oat stem rust--Oat stem rust is widely distributed throughout commercial oat fields of the north central United States. The severities range from 10% at soft dough, to trace at the flowering stage. Early oat rust infection centers were observed throughout the oat growing area. However, in many cases, disease

development was slowed after the first generation because of unavailable free moisture. The initial infected area was as large as in 1977, but the intensity was much less. Losses may occur in some of the late maturing oats in the Dakotas and Minnesota, but will be less than 1977. Preliminary data from the race survey are as follows:

Area	No. of Collec.	No. of isolates of each race								
		NA-1*	NA-2	NA-3	NA-5	NA-7	NA-16	NA-24	NA-27	NA-29
Florida	2								6	
Kansas	2						1		4	
Minnesota	1								3	
Oklahoma	1						2			
S. Texas	81	12	2	4	9	1	6		186	11
N. Texas	33	12						6	74	

Oat crown rust--Crown rust severities at soft dough ranged from trace to 80% in southern Minnesota and trace to 40% in southeastern South Dakota. Losses will occur in some of the severely rusted fields in Minnesota and South Dakota.

Barley stem and leaf rust--Barley stem rust collections were made in Monroe County, West Virginia (Bostic), Brown and Dakota Counties, Minnesota. Barley leaf rust severities ranged from trace to 40% in South Dakota and southern Minnesota nurseries.

Rye stem and leaf rust--Rye stem rust collections were made in 4 different counties in southeastern Minnesota. In 1979, rye leaf rust severities are higher than in recent years; 40% severities were not uncommon in commercial fields.

Barberry--The majority of the aecial collections submitted this spring were from Iowa, Minnesota, and Wisconsin, and were identified as rye stem rust. The following races were identified from collections made in Ontario, Canada: TBM, and NA-25 (see tables).

Other grasses--In Rice County, Minnesota, stem rust collections were made from Phleum pratense and Agropyron repens (Laudon, Schlick & Schulz). Traces of stem rust exist on Hordeum jubatum in South Dakota and Minnesota.

CEREAL RUST BULLETIN

Report No: 8
August 8, 1979

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)

Small grain development is 1-2 weeks behind normal in the North Central States, but with continued warm weather and adequate moisture the crop will develop fast. Approximately half of the small grains are combined in the Pacific Northwest.

Wheat Stem Rust--Collections of wheat stem rust were made in a Michigan winter wheat field (Clayton) and in a spring wheat nursery in Champaign, Illinois (Jedlinski). These were the first wheat stem rust collections made in these two states this year. Traces of wheat stem rust were found in a north-central Iowa spring wheat nursery (Michel). Only trace amounts of stem rust have developed in plots of susceptible wheat cultivars in South and North Dakota (Jons). As stated in the previous bulletin, this is the lightest wheat stem rust infection in years and no significant losses are expected in the resistant spring or durum cultivars. Preliminary data from the race survey are as follows:

		No. of isolates of each race																		
		11		15			17		29	113			151			56				
Area	No. of Collec.	RCM	RCR	TLM	TDM	TNM	HNL	HDL	HJC	RTQ	RPQ	RKQ	QFB	QCB	QSH	MBC				
Alabama	4	7							3											
Florida	1						2	1												
Georgia	6												16	1						
Kansas	4					3						1	3			1				
Louisiana	2													6						
Minnesota	1												3							
Oklahoma	4			2	3	2		1							3					
S. Dakota	2		2			1										1				
S. Texas	11					1		1	3	3	1		3							
N. Texas	5	3		2				3					1		5					
Cd Obregon, MX	6						4	2	9				3							

Wheat leaf rust--Leaf rust is prevalent at low levels on the commonly grown spring wheat cultivars in Minnesota, South and North Dakota. No significant rust increase is expected in the spring wheats.

Oat stem rust--Traces of oat stem rust were observed in commercial fields throughout the northern oat growing region. In a few South Dakota fields 60% severities were reported, but the losses will be light in these fields because of the advanced stage of the crop. Losses may occur in some of the late maturing oats in the Dakotas and Minnesota, but will be less than 1977. Preliminary data of the 1979 oat stem rust survey follows:

Area	No. of Collec.	No. of isolates of each race								
		NA-1*	NA-2	NA-3	NA-5	NA-7	NA-16	NA-24	NA-27	NA-29
Florida	2								6	
Kansas	4						1		7	
Minnesota	2								6	
Oklahoma	1						2			
S. Texas	81	12	2	4	9	1	6		186	11
N. Texas	34	12						6	76	

*See Phytopathology 69:293-294

Oat crown rust--Crown rust is severe in some late planted fields in northern South Dakota and west central Minnesota. Fields with severities as high as 60% in the milk stage will have 5-10% losses. As in 1978, the oat fields severely infected with crown rust are generally scattered and are the later maturing fields. There is little crown rust resistance in the commonly grown oat cultivars in this area.

Barley stem rust--Traces of stem rust were found in barley experimental plots in Codington Co., South Dakota. Little or no disease is expected to develop in commercial fields. A barley stem rust collection made in western Kansas in late June was identified as race TLM.

Other grasses--Stem rust collections were made from Hordeum jubatum in Walsh Co., North Dakota (Fitchett) and Rice Co., Minnesota (Schulz). The first rust collection from timothy in 1979 was made July 27 in Steele Co., Minnesota (Laudon, Schlick, and Schulz).

Other diseases--In some areas of Minnesota, South Dakota, and North Dakota, Septoria leaf blotch is heavy. In east central Minnesota bacterial leaf blotch was moderate to severe. These diseases along with leaf rust occupy the same sites on the wheat leaf.

CEREAL RUST BULLETIN

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(In cooperation with the Minnesota Agricultural Experiment Station)

The small grain harvest is gaining momentum throughout the northern United States grain growing region. However, the harvest in the North Central states remains far behind normal. Some fields along the Canadian border will require 1 to 2 additional weeks to mature.

Wheat stem rust--Wheat stem rust was the lightest in recent years throughout the United States. The scarcity of stem rust was predicted in April due to the reduced overwintering in south Texas, and the absence of rust in central and north central Texas. The majority of stem rust collections received at the Cereal Rust Laboratory were made in plots of known stem rust susceptible cultivars. For example, in a susceptible plot at Langdon, North Dakota, rust reached 30% severity at mid-dough. In the fall of 1978, plots of a susceptible stem rust cultivar were planted throughout the south. In a few of these plots, stem rust overwintered in southern Texas, northeastern Louisiana, and south-central Georgia. The majority of collections made in commercial fields were from winter wheat fields in Alabama, Kansas, Michigan, South Dakota, and Wisconsin. No new hazardous stem rust virulences were detected in 1979, and thus, the predominant cultivars of durum, hard red spring, northern soft red winter, and northern hard red winter wheats remain resistant to stem rust. Stem rust was insufficient in 1979 to result in significant losses. Preliminary results of the wheat stem rust survey are shown in Table 1. Race 15-TNM is the most commonly identified race (32%) of the isolates this year, but is 20% less than in 1977 and 1978. Race QFB replaced TDM as the second most commonly identified race. The rank and frequency of races may shift as more collections are identified.

Table 1. Preliminary data of the 1979 wheat stem rust race survey (8/21/79)

		Precent of isolates of each race																		
		11		15			17			29	113			151			56	32		
Area	No. of Collec.	RCM	RCR	TLM	TDM	TNM	HNL	HDL		HJC	RTQ	RPQ	RKQ	QFB	QCB	QSH	MBC	RJC		
Alabama	4	70								30										
Florida	1						66	33												
Georgia	6													94	6					
Iowa	2					100														
Kansas	11					59							18	11		4	4	4		
Louisiana	2														100					
Minnesota	4					58								42						
Nebraska	1					100														
N. Dakota	3					100														
Oklahoma	4			18	27	18		9								27				
S. Dakota	3		29			14							14			29	14			
S. Texas	11					5		5		17	17	5		50						
N. Texas	5	21		14				21						7		36				
Wisconsin	2					80				20										
1979	59	7	1	3	2	32	1	4		5	2	1	4	23	5	8	1	1		
1978	320		*	*	13	57		1		*	4	1	2	5	2	11	1			
1977	445		1	1	7	53		*				1	3	6	5	17	3			

* Less than 0.6%

Wheat leaf rust--Leaf rust was widespread, but light throughout the winter and spring wheat growing areas of the U.S. A lack of overwintering inoculum in Oklahoma, Kansas, and Nebraska resulted in low disease severities and minimal losses in this area. Resistant cultivars in the northern soft red winter, hard red spring wheat, and durum areas prevented losses in these areas. There was some shift in pathogen virulence that apparently was inadequate to affect the commercial cultivars. The most severe leaf rust was in the southern low plains of Texas. A few fields were moderately rusted in the Dakotas and Minnesota.

Oat stem rust--In April 1979, oat stem rust was widespread but light in south Texas and absent in central Texas. A rapid increase in disease was anticipated; however, a high percentage of this southern oat rust was avirulent on Pg-2 or 4, which are found in the spring oat cultivars. Thus, the lack of inoculum of virulent races delayed the disease increase during May. Centers of stem rust infection were noted in Minnesota from rust inoculum that arrived in late May. These centers were widely scattered, however, as secondary spreads indicated that they may have been as infrequent as one per county. Although the initial infection was 20 days earlier than normal, the low prevalence offset the potential effect of early arrival on the epidemic. Thus, moderate losses occurred in the initially infected fields and light to moderate losses will occur in late planted fields in the Dakotas and Minnesota. Oat stem rust race NA-27 is the most prevalent race identified in 1979, Table 2. The majority of the oat collections from the Dakotas, Iowa, Minnesota, and Wisconsin, were received within the past 3 weeks and still are in the process of race identification. The early collections from these states have been predominately race NA-27. Race NA-16 frequencies are less than 1978; however, many wild oats collections on which NA-16 usually predominate, remain to be identified.

Table 2. Preliminary data of the 1979 oat stem rust race survey (8/21/79)

Area	No. of Collec.	Percent of isolates of each race									
		NA-1[a/]	NA-2	NA-3	NA-5	NA-7	NA-16	NA-23	NA-24	NA-27	NA-29
Florida	2									100	
Iowa	9									100	
Minnesota	32							3	6	91	
Oklahoma	1						100				
S. Dakota	5									100	
N. Texas	34	13							6	81	
S. Texas	81	5	1	2	4	*	3			80	5
Wisconsin	5									100	
1979	169	5	*	1	2	*	2	1	2	84	2
1978	422	3					12			84	
1977	756				1		3			95	

a/ See Phytopathology 69:293-294

* Less than 0.6%

Oat crown rust--In 1979, crown rust development throughout the southern U.S. was heavier than normal. Losses occurred in south Texas and late maturing fields in north central Texas. In the northern U.S. oat growing area, the severely infected oat fields were scattered and primarily in Minnesota and the Red River Valley of the Dakotas. Crown rust will account for more loss in Minnesota and South Dakota oat fields than stem rust in 1979.

Barley stem rust--In 1979, barley stem rust was light throughout the U.S. However, scattered small to moderate sized uredia were observed in late maturing fields in the Red River Valley of the North last week. Losses will be none to light.

Barley leaf rust--Leaf rust infection was heavy in barley nurseries and light in commercial fields with the exception of northwest Minnesota and eastern North Dakota where 30% severities were reported in late maturing fields last week. This was the heaviest barley leaf rust infection in the last two years in the Dakotas and Minnesota.

Rye stem rust--Traces of rye stem rust were found in nurseries and fields throughout the U.S. Wheat stem rust races TNM and TLM were identified from rye stem rust collections made in southern Minnesota.

Rye leaf rust--In 1979, rust severities were more extensive on rye than previous years. Rye losses were light and localized.

Other stem rust collections--Hordeum jubatum, bearded wild barley, and Avenae fatua, wild oats, rust collections were made throughout northern South Dakota, western Minnesota and North Dakota. Wheat stem rust races TNM, RKQ, and QSH were identfied from rusted collections of Agropyron repens, quackgrass, made in southern Minnesota. Races TLM and QSH were identified from a rusted timothy (Phleum pratense) collection made in early July in Rice Co., Minnesota.

Barberry--In 1979, aecial collections were made in West Virginia, Iowa, Minnesota, Wisconsin, and southeastern Canada. More aecial infection was observed on barberry bushes in West Virginia than in the last 5 years. The aecial infection was heavier than usual on barberries growing in the upper midwest because of extended cool moist spring conditions, allowing for abundant and continued basidiospore production. The majority of the aecial collections were identified as Puccinia graminis f. sp. secalis, although P. g. tritici and P. g. avenae races were also identified.