

CEREAL RUST BULLETIN

Report No.: 1
Date: April 30, 1974

From:
CEREAL RUST LABORATORY
AGRICULTURAL RESEARCH SERVICE (ARS)
U. S. DEPARTMENT OF AGRICULTURE
UNIVERSITY OF MINNESOTA, ST. PAUL 55101

Issued By:
ANIMAL AND PLANT HEALTH INSPECTION SERVICE
U. S. DEPARTMENT OF AGRICULTURE
(In cooperation with ARS and the
Minnesota Agricultural Experiment Station)

Cereal crops in south and west Texas were severely damaged by a winter drought. The best dryland wheat in Texas is in the Red River Valley between Vernon and Wichita Falls and in the area north of Dallas. A few fields were observed north-east of Vernon in which the upper half of the heads was killed by freezing. Recent rains in north-central Texas insure adequate to surplus moisture for this crop. Elsewhere, with the exception of the Oklahoma Panhandle and southwestern Kansas, moisture is currently adequate to surplus in the southern and central Great Plains. A warm humid winter in the states along the Gulf coast has resulted in disease problems and patches of unvernalized wheat. A March freeze caused some damage to early wheats and barleys from Arkansas to Georgia.

Wheat stem rust.--Stem rust was much lighter in the Yaqui Valley of Mexico than normal (Smith, Vazquez). Stem rust is present in nurseries at Beeville, College Station, and Chillicothe (Schuette), Texas. Severities are light except at Beeville where a trap plot of McNair 701 was killed. Light infections were found in a commercial field in both Hays and Wilson Counties in south Texas and Fannin County in north-east Texas. A small overwintering center was found in a nursery in Desha Co., Arkansas. Stem rust was severe in a nursery at Crowley, Louisiana and present at Baton Rouge. West of the Mississippi River the level of stem rust is similar to 1973 except for the field in Fannin County. A stem rust epidemic has developed in fields of McNair 701 in Okaloosa (Barnett), Calhoun, Santa Rosa, Jackson (Newton, Barnett) Counties in Florida; Bulloch (Newton), Stewart (Crawford), Sumter (Morey), Thomas (Morey), Jefferson (Morey), and Terrell Counties in Georgia; Coffee (Morey, French) County, Alabama; Jackson (Singleton, Futrell) County, Mississippi. Stem rust is also present in commercial fields in Baldwin, Escambia, and Mobile (Singleton) Counties in Alabama, George (Singleton) County, Mississippi, and in nurseries in the following counties: Tift, Georgia; Gadsden, Florida; Dallas and Lee, Alabama; Allendale, South Carolina (Harrison); and Scotland, North Carolina. Stem rust is more severe in the Southeast than in 1972. Fortunately, the varieties of the Arthur type and Blueboy II are highly resistant. Holley, Wakefield, and Coker 68-19 were not observed to be more than lightly rusted; however, during the past 10 days there has been a rapid increase in disease with severities at mid-dough of 10-30% (Barnett). Losses will be severe in fields of Blueboy and McNair 701 throughout the soft red wheat area east and north of Mobile, Alabama.

Wheat leaf rust.--Leaf rust is widespread and moderate to heavy throughout the southern states, where moisture has been adequate. Flag leaf severities were 50-80% on susceptible varieties (approximately 50% of the acreage) in the area north of Dallas. The crop in this area is in the berry stage and a loss of 10% is expected. Leaf rust losses of 10 to 15% are predicted for central and south-central Oklahoma (Young et al). A potential for leaf rust losses of 10-15% exists in all areas of Kansas except the southwest (Eversmeyer). In the southeastern states, leaf rust was severe on susceptible varieties in nurseries as far north as Normal, Alabama (Sapra) and Laurinburg, North Carolina (Newton). The leaf rust resistance of Transfer (LR 9) is now ineffective in the South as a single source of resistance. The commercial varieties with this type of resistance are Coker 72-5, Riley 69, and McNair 701. Otherwise, no changes were noted in varietal resistance. A single collection of rust from Bossier City (Tipton), Louisiana on Blueboy II was found to be leaf rust.

Wheat stripe rust.--A small center of stripe rust was found in the wheat nursery at Rohwer in Desha County, Arkansas. The severity was 90-100% on the flag leaves over an area of approximately 100 ft². Another infection was found at Bossier City, Louisiana (Tipton). Stripe rust is severe in Sutter County, California on Pitic 62 (Line). Traces of stripe rust occur in the Pacific Northwest and could become epidemic if the weather remains cool and moist (Line).

Oat stem rust.--Stem rust is light and has been reported only from nurseries at College Station, Beeville, and Robstown (Browning), Texas; at Crowley and St. Joseph (Tipton), Louisiana; Poplarville (Singleton), Mississippi; and Quincy, Florida. Thus, the frequency and severity is less than normal.

Oat crown rust.--Crown rust is severe along the Gulf coast but is generally light inland. A rapid increase in disease is now anticipated with warm weather and recent rains. Only four commercial varieties are resistant, Coker 227, Coker 234, TAM-0-301, and TAM-0-312. Crown rust also is light to moderate on some plantings of Gulf Rye Grass in south Texas.

Barley stem and leaf rusts.--Stem rust is generally light and limited to nurseries. Leaf rust is heavy in nurseries in Florida and southern Georgia. A heavy infestation was reported on Barsoy at Plains, Georgia (Morey). Trace amounts of leaf rust are present as far north as Laurinburg, North Carolina (Newton).

Rye stem and leaf rusts.--Stem rust was observed in the Beeville, Texas nursery and in Jefferson (Prichard) County, Georgia and Hoke (Newton) County, North Carolina. Leaf rust is generally light to moderate across the South; however, it is severe in Hoke (Newton) County, North Carolina. Leaf rust overwintered in a nursery at Rosemount, Minnesota on winter rye.

Barberry.--No pycnia or aecia have been reported on barberry yet.

Septoria nordorum is severe on wheat in southern Alabama, Georgia, and the Florida panhandle; some fields have been destroyed. Powdery mildew was widespread in the Southeast (Newton) but probably was somewhat less severe along the coastal areas than in the past two years.

PLEASE NOTE: The zip code for the Cereal Rust Laboratory has been changed to 55108. In addition to our commercial phone lines, the Laboratory now has an FTS phone: - (612) 725-2069.

CEREAL RUST BULLETIN

Report No.: 2
Date: June 4, 1974

From:
CEREAL RUST LABORATORY
AGRICULTURAL RESEARCH SERVICE (ARS)
U. S. DEPARTMENT OF AGRICULTURE
UNIVERSITY OF MINNESOTA, ST. PAUL 55101

Issued By:
ANIMAL AND PLANT HEALTH INSPECTION SERVICE
U. S. DEPARTMENT OF AGRICULTURE
(In cooperation with ARS and the
Minnesota Agricultural Experiment Station)

Small grain cereal crops range from near normal maturity in Texas and southern Oklahoma to a week early in Kansas and Nebraska. In the northern counties in North Dakota and northwest Minnesota, many fields are not planted. This area is at least 4 weeks behind normal. Rains in part of Texas and Oklahoma occasionally have interrupted harvest. Yields in Texas are less than in 1973 but better than expected. Scattered hail and excessive water have damaged some fields in Kansas and Oklahoma. A rather large area of severe wheat streak mosaic occurs in a six county area around Hays and Great Bend, Kansas and extends to the northeast. In Kansas, the wheat maturity varies from hard dough in the south to early dough in the north.

Wheat stem rust.--Stem rust was first found in Kansas on May 20 (Schultze, Eversmeyer). Since then stem rust has been reported from the majority of counties east of a line from Kiowa County in south-central to Rooks County in north-central Kansas (Hammon, Porterfield, Romig, Eversmeyer, Goodfellow, Fitchett). Severities range from a trace to 5% in commercial fields in the southeast to a trace in the north. Limited harvesting has been done in southern Kansas. No stem rust has been reported from Nebraska. To the east, stem rust was found in trace amounts in Cape Girardeau County, Missouri at mid-dough (Gurley) and Monroe County, West Virginia on Thorne and Blueboy wheat at flowering (Bostic). In Oklahoma and north-central Texas, only traces of stem rust developed outside of nurseries with a few exceptions. A few fields of Blueboy in Fannin County, Texas had terminal severities up to 30% and the seed from one sample was so badly shriveled that the test weight would be less than 55 lb/bu. A field with a terminal severity of 20% was observed in Cotton County, Oklahoma, and another with a terminal severity of 7% was reported in Grayson County, Texas (Eversmeyer).

With the exception of the few fields in Fannin and Grayson Counties in Texas and Cotton County in Oklahoma, losses due to stem rust will be only a trace in these states. The Fannin County area demonstrates the differences in the susceptibility of Blueboy and other 'susceptible' wheats such as Knox 62, Caddo, and Sturdy that occur in that area. Losses in Kansas and southeastern Nebraska should be light, although with favorable weather some fields will have noticeable stem rust at harvest. The late planting in North Dakota and Minnesota increases the likelihood of having some rust in the spring wheat area. Near St. Paul, Minnesota, stem rust uredospores were trapped in rain samples during periods of May 17-24 and May 24-29. Thus, stem rust infection probably occurred and the first uredia should be found this week. Recent frequent rains and warm night time temperatures are providing an excellent environment for rust development.

The preliminary results of the race survey are shown in Table 1. Caution should be used with this data, as the recent collections this year have contained a higher percentage of the more virulent races RYQ and RPQ than the April collections. Seedling tests indicated the Arthur types of wheat were susceptible to a culture of race RPQ selected from an early collection made in Louisiana. Field collections from the Arthur types, however, indicated a lower prevalence and severity than on the varieties of McNair 701 and Blueboy in the same area. Insufficient collections from Arthur, Arthur 71, Oasis, and Abe have been identified to draw any conclusions concerning mature plant resistance. Race TNM was found (Table 1) in south Texas, where previously race 15-TLM or -TNM had not been found in recent years.

Wheat leaf rust.--Leaf rust varies from moderate to severe across the eastern two-thirds of Kansas, and losses of 10% will be common in this area. In Nebraska leaf rust severities varied widely and were heaviest in Furnas County, where one 60-acre field had 20% severity at heading (Palmer, Lane, Doupnik). Losses should be light to moderate and average from a trace to 5% in Nebraska. Trace to 1% of leaf rust is reported on winter wheat in Minnesota, Illinois (Komanetsky), Ohio, and

Virginia (Tate). In Missouri leaf rust ranges from trace to 60% severity and from 50 to 100% prevalence.

Leaf rust is present on Agent at Manhattan, Kansas, 30% (Browder) and Clay Center, Nebraska, 5% (Palmer); however, the most susceptible material ranged from 40-100% severity at the same time. Thus, LR 23 is not providing full protection in the central Great Plains. Traces of leaf rust were observed on a McNair 701 (LR 9) plot at St. Paul, Minnesota.

Leaf rust was reported on Leeds durum in San Diego County, California (Garcia, Leyva). Traces of leaf rust were observed in Washington (Line); however, temperatures have been too low for the maximal rate of disease increase.

Wheat stripe rust.--As previously reported, stripe rust was severe in Sutter County, California. Some fields were cut for hay (Line). Stripe rust is more prevalent at this date than in any year since 1968 in Washington. October rains followed by a mild winter and a cool wet spring resulted in very favorable conditions for stripe rust. Only warmer and drier weather will prevent moderate losses in some fields due to stripe rust.

Oat stem rust.--Stem rust has increased and moved northward during the past month. Severities have been light, causing little damage. Stem rust is present in nurseries at Waco and Dallas, Texas. In commercial fields, oat stem rust is present in Darlington County, South Carolina (Harrison) and Sumter County, Georgia (Morey). Stem rust was observed on wild oats in Sutter County, California (Line).

The results from the identification of the early collections of P. graminis f. sp. avenae are shown in Table 2. Races 31 and 61 are the most common, as they have been in recent years. All the races identified to date in 1974 have been avirulent on pg-9 and pg-13, except race 76 that is virulent on both.

Oat crown rust.--Crown rust increased rapidly in the southern portion of the winter oat producing area. Crown rust of 80% severity was observed a week ago in north-central Texas (Eversmeyer). Traces were reported in Missouri and Kansas (Porterfield, Hohnholt) last week. Most of the spring oats were planted at near the normal time; however, crown rust will probably cause moderate to severe losses in late planted Minnesota and North Dakota fields. Crown rust is severe on wild oats in Sutter County, California (Line).

In spore trapping studies at the University of Minnesota buckthorn plots, natural basidiospore release occurred on April 27, 28, May 9, 10, 11, 13, and 21. The first pycnia were observed on May 8, and additional pycnia appeared on May 20 and May 28. Pycnial infection is very heavy. The first aeciospores were observed on May 21. In Wisconsin aecia were observed on May 21; thus, with favorable weather as in 1973, crown rust could again cause a 10% loss in Wisconsin.

Barley stem rust.--Traces of stem rust were found on Keowee barley planted adjacent to a field of McNair 701 wheat that was severely rusted in Jefferson County, Georgia (Prichard). Early identifications of races from barley were: QSH (2 collections), Bee County, Texas; TLM and HNL (2 collections), Gadsden County, Florida; and HNL (2 nursery collections), Yaqui Valley, Mexico. Note the other wheat stem rust races identified from the area in Table 1.

Barley leaf rust.--No leaf rust has been reported in the north-central states, but this crop is late and the potential for leaf rust development is good. In Virginia and West Virginia where barley is in the milk stage, light amounts of leaf rust are common, and a few fields had severities of 30-50% (Bostic, Fulk) where losses would be from 1-5%. In a few collections from West Virginia submitted as stem rust we found 5-35% of the leaf sheaths to be covered with leaf rust.

Rye stem rust.--No additional spread of rye stem rust has been observed. Three collections have been identified as follows: P. graminis f. sp. secalis, Bee County, Texas; 1 isolate MBC, Jefferson County, Georgia; and 3 isolates TLM, Hoke County, North Carolina. Compare with all isolates of wheat stem rust identified in Table 1.

Table 1. Preliminary results of the 1974 wheat stem rust race survey (6/3/74).

Area	No. of iso-lates	Percentage of isolates of each race													
		17		?	?	151			?	11-32-113			15	15B-2	
		HDL	HNL	MBC	QCC	QCB	QFB	QSH	RCR	RKQ	RPQ	RTQ	TBM	TLM	TNM
AL	36		28	3		3	44	3		11	6			3	
AK	2		50												50
FL	62		18	3		3	3	6		34	2	10	5	6	10
GA	36	3	6	3	3	6	63			3	6			3	6
LA	39							2	15		23	8		31	20
MS	15			69			13				13	7			
NC	9					33	33							33	
SC	6					17	50	33							
TX ^{1/}	43	5					23	21							51
TX ^{2/}	62		6			2	19							8	64
TX ^{3/}	29		3	3			3			3	3			31	52
MEX ^{1/}	15						20			33		47			
MEX ^{2/}	36		58				42								
USA	339	1	8	4	.3	3	21	5	2	8	5	3	1	10	28

TX^{1/} Counties extending south of the 30° parallel.
 TX^{2/} Counties entirely between the 30° and 33° parallel.
 TX^{3/} Counties extending north of the 33° parallel.
 MEX^{1/} CIMMYT inoculated nursery at Ciano.
 MEX^{2/} Uninoculated nurseries in the Yaqui Valley.

Table 2. Preliminary results of the 1974 oat stem rust race survey (6/3/74).

Area	Number of isolates	Percentage of isolates of each race					
		2	6AF	7F	12F	6F	1H
Florida	9		33	67			
Louisiana	6	50	50				
Mississippi	3						100
Texas-South ^{1/}	51		67	6	10	18	
Texas-North ^{2/}	23		52	26	13	9	
USA	92	3	56	16	9	12	3

^{1/} Counties extending south of the 30° parallel.
^{2/} Counties entirely north of the 30° parallel.

Rye leaf rust.--Light amounts of rye leaf rust exist in the eastern states as far north as West Virginia (Bostic, Fulk) and Virginia (Whitley, Hoyos, Tate). Light amounts also were common in rye nurseries in Minnesota at heading.

Barberry.--Black stem rust.--Aecia were observed throughout the southern West Virginia and western Virginia area by the end of May (Saunders, Callahan, Bostic, Fulk). The early collections of aeciospores were avirulent on wheat and oats. A single aecial collection was made in Huntingdon County, Pennsylvania on May 6 (Maxwell). In Wisconsin, aecia were reported on May 23 in Racine and Waukesha Counties (Line, Bennett, Hartman, Heffel). In Centre County, Pennsylvania pycnia were observed on May 21 and aecia on May 31 (Keim).

Only pycnial infections have been reported in Iowa (Delaware County) and Minnesota (Winona County, Laudon).

NOTICE: At this time, we badly need more collections of oat stem rust. Also needed are collections of wheat stem rust from Arkansas, Kentucky, Missouri, and Tennessee.

CEREAL RUST BULLETIN

Report No.: 3
Date: June 18, 1974

From:
CEREAL RUST LABORATORY
AGRICULTURAL RESEARCH SERVICE (ARS)
U. S. DEPARTMENT OF AGRICULTURE
UNIVERSITY OF MINNESOTA, ST. PAUL 55101

Issued By:
ANIMAL AND PLANT HEALTH INSPECTION SERVICE
U. S. DEPARTMENT OF AGRICULTURE
(In cooperation with ARS and the
Minnesota Agricultural Experiment Station)

Rain has been widespread over much of the central and northern Great Plains during the past two weeks. These rains with accompanying hail and wind have caused some losses in Kansas where some of the wheat has lodged and most of the straw is discolored. Harvest in southern Kansas was delayed by rain until last weekend. The Kansas wheat maturity ranges from ripe in the south to mid-dough in the north. Early oats in Kansas are in the milk stage, and some are headed as far north as central Iowa; however, most of the Iowa crop is in the heading to late boot stage. Winter wheat is at the early dough stage in Nebraska, flowering in Minnesota, heading in South Dakota, and ranges from early boot to heading at Casselton, North Dakota. In North Dakota 80 to 90% of the spring grain is planted. In general, conditions for disease development on cereals has been good to excellent during the past two weeks.

Wheat stem rust.--Natural stem rust has been found in plots in Clay County, Nebraska (RedChief, 1% severity) and in commercial fields in Nemaha, York, Polk, and Colfax Counties, Nebraska. Traces of stem rust were reported in Chase and Sheridan Counties in Nebraska (Goodfellow, Fitchett). Stem rust is widespread on Hordeum jubatum throughout eastern Nebraska and northwestern Iowa. A commercial field was observed near Silver Creek, Nebraska with 20% severity at early dough. Stem rust was found in a plot of McNair 701 (5 pustules per tiller) in Dakota County, and in a commercial winter wheat field in Nicollet County, Minnesota. Stem rust remains widespread in Kansas with severities generally a trace to 5% in commercial fields; however, in a few fields of Parker in north-central Kansas severities of 30% were noted (Browder). In plots of highly susceptible varieties, severities of 60% were observed (Eversmeyer). The level of stem rust infection in Kansas and Nebraska is as great or greater than it was in 1972, when some fields of spring wheat rusted. Stem rust was found in trace amounts in Andrew, Clinton, and Marion Counties in Missouri. Stem rust was light to moderate in Virginia and West Virginia. In Illinois, stem rust was found on winter wheat in Moultrie County (Komanetsky, Schafer). Table 1 shows the percentage of isolates of each race identified from collections made in the USA to date in 1974.

Wheat leaf rust.--Leaf rust is severe in southeast Nebraska and west-central Iowa. Some concern has been expressed about leaf rust on Era. Era is susceptible to many cultures of leaf rust as seedlings; however, it has always been resistant as an adult plant in Minnesota. The type of adult plant resistance in Era has been inadequate in the southern Great Plains for several years. In a 1973 test nursery at Beeville, Texas, leaf rust was observed to be 80% severe on Era at maturity. At this time, it is not known if races virulent on adult Era are present in the northern spring wheat area. Currently at Rosemount in the tillering stage, Era has 0.5%, Baart has 10%, and Thatcher has 10-20% leaf rust severity, respectively. Current levels of leaf rust on the latter two varieties indicate that leaf rust will severely damage fully susceptible spring wheats in this area.

Oat stem rust.--Few reports of oat stem rust were received during the last two weeks. Stem rust collections were received from Canadian County, Oklahoma (Fitchett, Goodfellow), and Yolo County, California from wild oats (Acosta). No rust was observed early last week in southern Kansas. Identifications are shown in Table 2.

Oat crown rust.--Crown rust is light in eastern Kansas and Missouri. Traces were found in northwestern Iowa, eastern Nebraska, and south-central Minnesota, and traces were reported in Pennsylvania. Buckthorns were reported infected in Rice and Carver Counties in Minnesota.

Barley leaf and stem rusts.--Traces of barley leaf rust were observed in southern Minnesota and northern Iowa. Leaf rust severity of 15% was reported in Virginia (Saunders). Stem rust was observed in trace amounts on barley in southern Minnesota and northern Iowa.

Rye leaf and stem rusts.--Traces of leaf rust are present on rye in Pennsylvania, Virginia, West Virginia, and Minnesota. In southern Minnesota leaf rust has reached 20% severity on winter rye. Stem rust on rye was observed in Dakota County, Minnesota and in Virginia (Callahan, Stewart).

Barberry.--Black stem rust.--The first reports of aecial infections were received from Minnesota (Rice County) and Michigan (Macomb County). An aecial collection from Wythe County, Virginia was identified as *P. graminis* f. sp. *avenae*, race 76.

Table 1. Preliminary results of the 1974 wheat stem rust race survey (6/16/74).

Area	No. of iso-lates	Percentage of isolates of each race													
		17		56	?	151			?	11-32-113			15	15B-2	
		HDL	HNL	MBC	QCC	QCB	QFB	QSH	ROR	RKQ	RPQ	RTQ	TBM	TLM	TNM
AL	39		26	2		2	41	2		18	5			2	
AK	2		50												50
FL	62		18	3		3	3	6		34	2	10	5	6	10
GA	40	8	2	1	2	5	60			2	10			2	5
LA	39							2	15		23	8		31	20
MS	20			55			30				10	5			
NC	9					33	33							33	
SC	18	28				11	44	11				6			
TX ^{1/}	43	5					23	21							51
TX ^{2/}	104		6			1	19							5	69
TX ^{3/}	44		2	2			2			2	2			27	61
USA	420	1	9	4	.2	3	21	4	1	7	4	3	1	9	33

TX^{1/} Counties extending south of the 30° parallel.
 TX^{2/} Counties entirely between the 30° and 33° parallels.
 TX^{3/} Counties extending north of the 33° parallel.

Table 2. Preliminary results of the 1974 oat stem rust race survey (6/16/74).

Area	Number of isolates	Percentage of isolates of each race					
		2	6AF	7F	12F	6F	1H
Florida	9		33	67			
Louisiana	6	50	50				
Mississippi	3						100
Texas-South ^{1/}	126		79	10	4	7	
Texas-North ^{2/}	35		68	17	8	6	
USA	179	2	73	13	4	6	2

^{1/} Counties extending south of the 30° parallel.
^{2/} Counties entirely north of the 30° parallel.

CEREAL RUST BULLETIN

Report No.: 4
Date: July 2, 1974

From:
CEREAL RUST LABORATORY
AGRICULTURAL RESEARCH SERVICE (ARS)
U. S. DEPARTMENT OF AGRICULTURE
UNIVERSITY OF MINNESOTA, ST. PAUL 55101

Issued By:
ANIMAL AND PLANT HEALTH INSPECTION SERVICE
U. S. DEPARTMENT OF AGRICULTURE
(In cooperation with ARS and the
Minnesota Agricultural Experiment Station)

Warm dry weather has prevailed over much of the northern Great Plains for the past week. Wheat harvest has moved into southern Nebraska. Wheat in the Nebraska panhandle, northeastern Colorado, and scattered areas in South Dakota are in need of rain; however, it is too late to help the cereal crops in the southern part of the area. In the spring wheat area hot dry winds have caused drought symptoms, probably due to shallow root systems that fail to adequately reach the subsoil moisture. Spring sown grains vary from headed to tillering depending on date of seeding. The latest crops are in northwestern Minnesota and northeastern North Dakota.

Wheat stem rust.--Stem rust was first reported in South Dakota on June 6 (Buchenau). Stem rust was present in trace amounts on winter wheat and Hordeum jubatum throughout southern and central South Dakota last week. Severities on susceptible varieties range from 5-20% (Wells). No stem rust was observed on commercial spring wheats. Terminal stem rust severities were generally a trace in north-central Kansas, northeastern Colorado, and Nebraska; however, a few scattered fields in eastern Nebraska had severities of 20-30% (cultivars Parker and Warrior). Stem rust severities in demonstration plots varied from 20-60% severity in southern Nebraska on susceptible varieties.

Traces of stem rust were observed on June 21-26 at Grafton, Fargo, and Wahpeton, North Dakota (Miller) on a susceptible barley variety, Wolfe, and on winter wheat. At Fargo stem rust was observed on the variety Sundance at heading.

Traces of stem rust were found last week in Minnesota on winter wheats, Hordeum jubatum, and on spring and durum wheats susceptible to race 15B-2. Plots of Cheyenne and McNair 701 naturally infected had 1 and 20% severity, respectively, at Rosemount, Minnesota.

Stem rust occurs in trace amounts in Iowa, Illinois, Indiana, Michigan, Pennsylvania, and Ohio. The wheat in the southern portion of this area is near maturity. In Monroe County, West Virginia stem rust is severe on the varieties Blueboy and Thorne, with severities of up to 60-70% at late milk to early dough (Bostic). Blueboy and McNair 701 were severely rusted (up to 80% severity) in Richmond County, Virginia. This is the most severe stem rust observed in eastern Virginia since at least 1947. (Roane). No collections have been received from New York State.

The preliminary results of the race survey are shown in Table 1. Race 151-QSH is known to attack Centurk. Race RCR has been isolated from Arthur-type wheats. The majority of the hard red winter wheats are resistant to members of the 151 and 11-32-113 race groups; however, these races offer the greatest hazard to the hard red spring wheats. Currently 151-QSH and 11-32-113-RKQ have been isolated only in trace amounts from Oklahoma, and one Kansas collection yielded race 11-32-113-RSH, with approximately half of the Kansas collections identified.

Wheat leaf rust.--Leaf rust is spotty in South Dakota winter wheat and flag leaf severities range from 5-50%. In Minnesota, leaf rust severities are moderate to heavy on winter wheat but only traces of leaf rust were observed in commercial spring wheats. Susceptible varieties such as Thatcher, however, were severely rusted at late boot in southern Minnesota. Leaf rust was first observed in North Dakota on June 4 (Miller, Statler) and is now moderate to heavy on winter wheat at flowering in eastern North Dakota. Some spring wheats in North Dakota were not jointing by last weekend. From Iowa to Virginia leaf rust varies from very light to heavy, depending on varietal resistance.

Oat stem rust.--The only recent report of stem rust was of trace amounts in commercial fields, Riley County, Kansas (Eversmeyer). Most of the northern crop except in the Red River Valley should be safe from stem rust. Stem rust has spread

from barberries to oats in a Centre County, Pennsylvania nursery (Keim). The preliminary data from the race survey is shown in Table 2. Races 31 and 61 apparently will be the most prevalent races again.

Oat crown rust.--Crown rust is now present in scattered fields from Nebraska to Virginia. However, the severities are much less than normal. The only reports of moderate amounts of crown rust in the major producing areas of Iowa, the Dakotas, Wisconsin, and Minnesota are fields associated with buckthorn hedges in the latter two states. Little crown rust should develop, except in the Red River Valley of the North, where adequate time remains for serious rust development.

Barley stem rust.--Stem rust is widespread in trace amounts on barley leaves in Minnesota, Iowa, and South Dakota. With the exception of known susceptible varieties, we have seen no stem rust on the stems of spring barley. Stem rust is light on winter barley in Nebraska, northwestern Kansas, and northeastern Colorado. There will be moderate amounts of stem rust on two-row spring barleys in western Nebraska at maturity.

Barley leaf rust.--Leaf rust severities are moderate in Virginia. In Minnesota and South Dakota leaf rust was light and in general, confined to the lower two or three leaves at heading. A rapid increase in leaf rust is anticipated; however, it probably will be severe only in the late planted fields in North Dakota and Minnesota.

Rye stem rust.--Several reports of rye stem rust have been received from Minnesota, Michigan, West Virginia, and Pennsylvania. Stem rust is generally light and will cause little damage.

Rye leaf rust.--Leaf rust on rye is moderate and is causing a premature defoliation of plants; however, at the current crop stage losses should be light.

Barberry.--Black stem rust.--Most aecial collections have been rye stem rust. Some aecial collections were avirulent on wheat, oats, barley, and rye, indicating that the rust forms attack other unknown gramineous host.

Orchard grass stem rust.--Severe stem rust was found on orchard grass in Summers County, West Virginia (Bostic) and near the barberry nursery in Centre County, Pennsylvania (Keim).

Table 1. Preliminary results of the 1974 wheat stem rust race survey (7/1/74).

Area	No. of iso- lates	Percentage of isolates of each race													
		17	56	151		?	11-32-113				15		15B-2		
		HNL	MBC	QCB	QFB	QSH	RCR	RKQ	RPQ	RSH	RTQ	TBM	TDM	TLM	TNM
AL	39	20	2	2	46	2		18	5					2	
AR	2	50													50
FL	75	15	4	3	4	5		28	9		8	4		8	12
GA*	51	10	2	11	51			8	8					2	6
LA	30					3	20		10		10			13	43
KS	120	1	2				1			1		1	6	18	71
MS	24		50		25		12		8		4				
MO	3			100											
NC	15			20	53									20	7
OK	60				8	7		2							83
SC	18	28	6	11	39	11					6				
TX ¹ / _*	52				19	17									60
TX ² / _*	99	6		1	18									5	70
TX ³ / _*	65	2	8		2			2	2					29	57
USA*	659	6	4	3	15	3	2	5	3	.2	2	1	1	9	46

* GA, .2% QCC; TX¹/_{*}, 4% HDL; USA, .3% HDL and .2% QCC.

¹/_{*} Counties extending south of the 30° parallel.

²/_{*} Counties entirely between the 30° and 33° parallels.

³/_{*} Counties extending north of the 33° parallel.

Table 2. Preliminary results of the 1974 oat stem rust race survey (7/1/74).

Area	Number of isolates	Percentage of isolates of each race						
		1	2	6AF	7F	12F	6F	1H
				31	61	70	72	76
Georgia	2							100
Florida	9		67	33				
Louisiana	9			33	67			
Mississippi	3							100
South Carolina	3				100			
Texas-South ¹ / _*	198	1		76	14	2	6	1
Texas-North ² / _*	33			45	36	9	9	
USA	257	.3	2	67	19	3	6	2

¹/_{*} Counties extending south of the 30° parallel.

²/_{*} Counties entirely north of the 30° parallel.

CEREAL RUST BULLETIN

Report No.: 5
Date: July 16, 1974

From:
CEREAL RUST LABORATORY
AGRICULTURAL RESEARCH SERVICE (ARS)
U. S. DEPARTMENT OF AGRICULTURE
UNIVERSITY OF MINNESOTA, ST. PAUL 55101

Issued By:
ANIMAL AND PLANT HEALTH INSPECTION SERVICE
U. S. DEPARTMENT OF AGRICULTURE
(In cooperation with ARS and the
Minnesota Agricultural Experiment Station)

Two weeks of hot weather with only scattered showers have resulted in rapid crop development and only limited rust development in the north-central states. Winter wheat is being harvested in western South Dakota, and oats are being harvested in southern Iowa. Most cereals are in the dough stage in the northern states except for the area of late planting in northeastern North Dakota and northwestern Minnesota. Conditions remain favorable for rust development in the Pacific Northwest.

Wheat stem rust.--Stem rust has spread north to the Canadian border in trace amounts. The dry weather and the advanced stage of the winter wheats from Montana to Ohio will prevent any further disease increase. Sufficient inoculum exists east of the Rockies to permit some stem rust on late-planted spring wheat if heavy dews occur in the next two weeks. Partial results of the 1974 wheat stem rust survey are given in Table 1. The race 15 group still predominates in the central Great Plains, with only trace amounts of other races. The race 151 group is the most important in the Atlantic coast states.

Wheat leaf rust.--Leaf rust is widespread on spring wheats, generally in trace amounts. Scattered showers during the past week will result in some disease increase. Although trace amounts of leaf rust exist on flag leaves of some previously resistant spring wheats, apparently it will not cause much loss. Leaf rust is severe in parts of the Pacific Northwest on winter wheats, and a 5% loss could occur (Line).

Wheat stripe rust.--Due to a wet summer, considerable stripe rust exists in Oregon, Washington, and Idaho. The previously resistant variety Paha has rusted. This is a different race (new?) than has been present in this area in recent years. It is also different than the race virulent on Pitic in California. Stripe rust could result in a 5% loss in the winter wheats. (Line)

Oat stem rust.--Traces of stem rust are now present in Iowa (Simons, Wallerich, Baker) and Minnesota (Krentz). Severities are very light, and even with an unexpected rapid increase little rust would be observed at harvest. Apparently oat stem rust overwintered only in south Texas and the area adjacent to the Gulf Coast, farther south than normal. Thus the northward rust movement was much later than usual. A further delay was caused by the dry weather in late June and early July that reduced the number of primary infections and prevented secondary infections. In contrast, wheat leaf and stem rusts overwintered further north and developed in northern areas before the dry weather affected disease increase. The Rust Lab needs oat stem rust collections for the race survey to insure that virulence for pg-9 and pg-13 have not increased in the northern United States.

Oat crown rust.--Crown rust is also light in the northern United States from North Dakota to Virginia. Disease development followed the pattern of oat stem rust.

Barley stem rust.--Traces of stem rust have been reported from Minnesota to West Virginia. No significant increase is expected.

Barley leaf rust.--Leaf rust development has generally been restricted to the lower leaves, as few infection periods have occurred during the past two weeks in the spring barley area of the north-central states. Little disease increase is expected except for the latest fields in the extreme northern part. Losses will be light.

Rye stem rust.--Stem rust is light on rye from Minnesota to Pennsylvania. No severe infections have been reported, and losses will be only a trace.

Rye leaf rust.--Leaf rust is severe on much of the rye. We have received a number of collections where leaf rust was severe on the leaf sheaths as well as on the leaves.

Barberry black stem rust.--Most of the aecial collections have been of various forms pathogenic for grass hosts. Several collections containing oat stem rust races 1 and 76 have been identified from collections received from Virginia and West Virginia. An aecial collection from the Centre County, Pa. barberry nursery was identified as oat stem rust races 87 and 94. Wheat stem rust races identified in aecial collections from Virginia, West Virginia, and Pennsylvania have been the common race (QSH, RKQ, RTQ, TLM, TNM) but some of these are atypical for the uredial collections from this area (note Table 1).

Table 1. Preliminary results of the 1974 wheat stem rust race survey (7/15/74).

Area	No. of iso.	Percentage of isolates of each race															
		17 HNL	56 MBC	151 QCB QFB		QSH	? RCR	11-32-113 RKQ RPQ RSH RTQ			15 TBM TDM		15B-2 TLM TNM				
AR	9	9	18	36												36	
IL	6				17											33	50
KS	443	*	1	*		1	1	1		1		2	3			18	72
MN	12																100
MO	14	a/		21		14										7	50
NE	18		6	39					6							11	39
NC	21			14	62				5							14	5
OK	99		2		6	4			3			1				12	72
VA	3			100													
WV	9			56			11										33
USA	1089	4	3	3	11	3	1	4	2	*	1	1	1			12	54

* Less than .06%.

a/ 17-HDC, MO 7%.

CEREAL RUST BULLETIN

Report No.: 6
Date: July 30, 1974

From:
CEREAL RUST LABORATORY
AGRICULTURAL RESEARCH SERVICE (ARS)
U. S. DEPARTMENT OF AGRICULTURE
UNIVERSITY OF MINNESOTA, ST. PAUL 55101

Issued By:
ANIMAL AND PLANT HEALTH INSPECTION SERVICE
U. S. DEPARTMENT OF AGRICULTURE
(In cooperation with ARS and the
Minnesota Agricultural Experiment Station)

Temperatures moderated last week and scattered light thundershowers occurred throughout Minnesota, eastern Montana, and the Dakotas. Most of this area is dry and crops need moisture. The main area where cereal crops are maturing late is north of U.S. Highway 2 in east and central North Dakota and northwestern Minnesota. Late last week, many fields just north of this line were flowering. South of this line many of the crops were swathed and some combining, especially of rye, winter wheat, and barley, was underway.

Test weights in many cases are lower than normal and yields less than originally expected due to the hot dry weather.

Wheat stem rust.--Wheat stem rust occurred in trace amounts on commercial winter wheat fields in the north-central states. Rust severities in plots of Sundance varied from a trace at Minot and Beach, North Dakota to nearly 5% at Sidney, Montana and 50% at Brookings, South Dakota. Commercial fields of spring wheat were generally free of rust, although an occasional rusted plant could be found with severities varying from a trace to 30%. Severities on susceptible spring wheats in nurseries varied as follows: 60% in Tuscola County and 40% in Huron County of Michigan (Clayton); 40% in Carrington, North Dakota; 20% in Morris, Minnesota; and a trace to 5% in Dickinson, North Dakota, Brookings, and Sidney.

Hordeum jubatum, bearded wild barley, was rusted throughout northeastern South Dakota, southern Minnesota, east-central Montana, and southern North Dakota last week.

Preliminary results of the race survey are shown in Table 1. The race 15 group continues to be the most common, with a scattering of other races occurring in trace amounts.

Wheat leaf rust.--Leaf rust remains light in commercial fields; however, traces are present on the varieties Era and Waldron which are normally rust-free. Most of the leaves prematurely dried from a combination of factors but primarily due to dry weather.

Wheat stripe rust.--Stripe rust was prevalent throughout Umatilla County, Oregon in early June when the wheat was in the milk stage. Approximately 8% of the fields had severities over 50% at that time, and losses of 20% can be expected in these fields. (Emge)

Oat stem rust.--Stem rust generally can be found in the eastern parts of the Dakotas, Iowa, Minnesota, and Wisconsin. Trace prevalences occur in commercial fields and up to 50% prevalence on Avena fatua, wild oats. Prevalence will increase in the late-planted area in the Red River Valley of the North but severities should be low. Oat stem rust also has been reported in Illinois (Jedlinski), Ohio (Warnke), Pennsylvania (Nelson), and California (Qualset).

Oat crown rust.--Crown rust has caused losses of 5-10% in some commercial fields of oats in Iowa (Simons). Crown rust is moderately severe in central Minnesota but elsewhere is present in trace amounts. No crown rust was observed in the western Dakotas or east-central Montana.

Barley stem rust.--Stem rust is widespread on barley both in commercial fields and plots in the north-central states. Severities are generally light, trace to 1%; however, this is more rust than normal. The variety Steptoe is rusted heavier than other commercial 6-row spring barleys.

Barley leaf rust.--Leaf rust has been severe in central North Dakota with terminal severities of 30-60%. This will result in a loss of about 5%.

Rye stem and leaf rusts.--Nearly all the rye is now mature and much of it has been harvested. No new reports of rust have been made in the past two weeks.

Barberry black stem rust.--Rust that is probably a spread from barberry has been reported on wheat in Whitman County, Washington (Delegans).

Table 1. Preliminary results of the 1974 wheat stem rust race survey (7/29/74).

Area	No. of iso-lates	Percentage of isolates of each race														
		17		56		151		?	11-32-113			15		15B-2		
		HDL	HNL	MBC	QCB	QFB	QSH	RCR	RKQ	RPQ	RSH	RTQ	TBM	TDM	TLN	TNM
CO	9						11									88
IA	7														43	57
IL	6					17									33	50
IN	3				100											
KS	520		*	1	*	*	1	*	1		1		2	3	18	72
MN	40				5		2							2	10	80
NE	178			1	1	5	2		3		1		*	2	26	58
OH	16		31		31	25	6									6
WV	50		4	4	18	40		2	2			2			12	16
VA	27	4		4	26	26	4		7			4			11	15
USA**	1454	.3	3.2	2.5	3.6	10.3	2.4	.9	3.4	1.3	.4	.9	1.1	1.4	14.3	53.9

* Less than .06%.

** .1% other races.

CEREAL RUST BULLETIN

Report No.: 7
FINAL ISSUE
Date: August 13, 1974

From:
CEREAL RUST LABORATORY
AGRICULTURAL RESEARCH SERVICE (ARS)
U. S. DEPARTMENT OF AGRICULTURE
UNIVERSITY OF MINNESOTA, ST. PAUL 55101

Issued By:
ANIMAL AND PLANT HEALTH INSPECTION SERVICE
U. S. DEPARTMENT OF AGRICULTURE
(In cooperation with ARS and the
Minnesota Agricultural Experiment Station)

During the past week, small grain cereal crops in northwestern Minnesota, the northern one-third of North Dakota, and northeastern Montana were surveyed. Crop maturity varies from a few fields still in the heading stage in the Red River Valley to ripe in the western and southern part of the area. However, most crops are in the milk to dough stages. Moisture is short throughout the area, but the driest areas are in the western part of the surveyed region and in Walsh and Cavalier Counties in N.D. Aphids are present throughout the area but losses probably will be limited to the Red River Valley. Grasshoppers are common, more severe in the south and western portion of the area, but numbers are not sufficient at present to result in much damage to the maturing cereals.

Wheat stem rust.--Stem rust occurs in trace amounts throughout the area except for Sheridan and Douglas Counties in Montana, and in most areas on Hordeum jubatum, wild barley. Trace amounts of stem rust were found in commercial fields of hard red spring and durum wheat. Susceptible varieties in nurseries throughout the area were only lightly rusted, except at Crookston, Minnesota where severities of 10% were observed on Baart, Marquis, and Mindum, and at Stephen, Minnesota (Skovmand). Stem rust is reported in trace amounts on winter wheat in Whitman County, Washington. Partial preliminary data from the race survey are shown in Table 1.

Wheat leaf rust.--Leaf rust is present in light amounts throughout the eastern one-half of the surveyed area, whereas the leaves have matured on all wheats in the western portion of the area. No leaf rust was observed on flag leaves of commercial durums. Although we continue to receive reports of leaf rust on the hard red spring wheat variety Era, leaf rust severities observed during the survey in plots and fields identified as Era never exceeded a few pustules per flag leaf. Severe leaf rust is reported in eastern Washington, where losses will exceed the previous estimate of 5% (Line).

Wheat stripe rust.--Another new race of stripe rust has been found in western Washington. This race is virulent on Yamhill, which is an important variety in western Oregon. (Line)

Oat stem rust.--Stem rust occurs in trace amounts in commercial fields from the Red River Valley to Minot, North Dakota. Stem rust was also observed on wild oats throughout northern North Dakota except for Williams and Divide Counties. Stem rust severities of 10% were noted in a few fields in central Minnesota, which is not a major oat-producing area.

Oat crown rust.--Crown rust is present in trace amounts throughout the surveyed area on commercial oats. Wild oats were lightly rusted throughout the area. A few severely rusted fields were observed in central Minnesota. Crown rust telia are heavy on stems in Wisconsin, but the major increase in severity occurred after most leaves dried from dry weather.

Barley stem rust.--Stem rust is present on barley in trace amounts throughout the area surveyed. Stem rust is apparently somewhat more severe on Manker than on the older varieties of Larker, Dickson, and Conquest. Commercial fields of Manker and Beacon in Marshall County, Minn. had stem rust severities of 10 and 5%, respectively, at the late milk stage (Skovmand).

Barley leaf rust.--Leaf rust has been moderately severe in the northern portion of the Red River Valley, causing light losses. Severe leaf rust was observed east of the Red River Valley on late-planted barley. Losses will be severe in these few fields.

NOTE: Recent correspondence from Dr. L. E. Browder at Manhattan, Kansas indicates that the leaf rust resistance gene in Agent has been designated LR 24. This gene has been incorrectly called LR 23 by U.S. workers. This gene also occurs in Blueboy II, Fox, Sage, and Cloud. Dr. Browder indicates that the stem rust resistance gene linked to LR 24 has been designated as Sr 24. Sr 24 has been used at the Cereal Rust Laboratory under the temporary designation Ag-2 assigned by Dr. F. J. Gough.

Table 1. Preliminary results of the 1974 wheat stem rust race survey (8/10/74).

Area	No. of iso.	Percentage of isolates of each race																
		17		56	?	151			?	11-32-113				15		15B-2		
		HDL	HNL	MBC	QCC	QCB	QFB	QSH	RCR	RKQ	RPQ	RSH	RTQ	TBM	TDM	TLM	TNM	
IA	34						3						3				26	68
IL	9						22	22									22	33
IN	12			25		33	17											25
KS	528		*	2		*	*	1	1	1		1		2	3		18	71
MI	33			3		24	9	15			3			3			3	39
MN	129		2	6	1	2	2	3						1	1		18	65
NE	229			1		1	5	3			2		1	*	3		23	61
OH	34		15	12		26	26	3									9	9
PA	46	9	6	4		6	46										13	15
SD	21	5					14										5	76
WI	5														20		20	60
WV	114	3	4	7		16	42		1	3			3		1		10	12
VA	29	3		7		24	28	3		7			3				10	14
USA	1830	1	3	4	*	5	12	2	1	3	1	*	1	1	1		14	51

* Less than .06%.