CEREAL RUST BULLETIN

Report No.: 1
Date: May 4, 1976

m:
REAL RUST LABORATORY
RICULTURAL RESEARCH SERVICE (ARS)
S. DEPARTMENT OF AGRICULTURE
IVERSITY OF MINNESOTA, ST. PAUL 55108

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

Winter in most cereal-growing areas was unusually mild and relatively dry. As a result most of the dryland wheat in the Texas and Oklahoma panhandles, south-central and southwest Kansas, and eastern Colorado suffered drought damage. An area in northeast Nebraska and adjoining Kansas suffered from winter killing due to abrupt warm periods followed by cold periods and the unusually small plants because of a dry fall. The season throughout the Great Plains is from 2 to 3 weeks earlier than normal, with a few southern Kansas fields reported to be headed. Much-needed rains came to portions of the Great Plains during late April; however, it arrived too late for part of the southern winter wheats. By the end of April, over 60% of the spring wheat was planted in Minnesota.

Wheat stem rust.--Stem rust is the lightest in years due to dry weather from January through April in Texas. Rust centers existed in the nurseries in Bee and Nuecus Counties, Texas in early April. An overwintering center was found in the Bell County trap plots. A few pustules were found in Texas commercial fields; two in Frio and one each in Live Oaks and Zavala Counties. The field in Zavala and one in Frio Counties were irrigated. No stem rust was observed in the southeastern U.S. in late April, which is less than normal for this time of year, and may be related to dry conditions there in February and April. Stem rust currently is present in the Obregon, Mexico nursery (Vazquez). Early collections from Beeville, Texas were identified as races QFB, TDM, and TNM. Wheat stem rust on rye survived the winter in a St. Paul, Minnesota nursery.

Wheat leaf rust.--The major southern soft red winter wheat varieties were only lightly rusted in the southeastern states. Leaf rust in the southern wheat variety nurseries ranged in severity from trace to 60%. Leaf rust is lighter than normal in south Texas. The early heavy severities in eastern Oklahoma decreased as the lower leaves died. Recent rains and the resulting late tillers should result in considerable leaf rust in these areas where inoculum is available.

Oat stem rust.--In early April stem rust was observed in the Beeville nursery and in a commercial irrigated field border in Frio County, Texas. During the past week additional infections were found in Uvalde (McDaniel) and Lampasas Counties, Texas. Early collections from Beeville were identified as race 31.

Oat crown rust.--Crown rust ranged from trace-5% severity along the Gulf Coast in commercial fields. In experimental plots the rust was generally observed on the Salem variety, and to a lesser extent on other varieties. Crown rust in south Texas is the lightest it has been in recent years. A few pustules were found in commercial fields in Karnes and Bastrope Counties, Texas. Severities of 30-80% were observed at College Station and Beeville in early April. Much of the commercial acreage in south Texas is planted with the crown rust resistant varieties Coker 234, TAM-O-301, and TAM-O-312.

Triticale stem rust.--Rust was observed on triticale at the Beeville, Texas and Obregon, Mexico nurseries.

Barley stem and leaf rusts.--The only stem rust observed on barley was at a Beeville, Texas nursery in early April. Leaf rust was light and scattered in some of the southeastern experimental plots.

Barberry rust.--The first aecial collection was made in Smyth County, Virginia (Saunders, 4/26).

Other diseases.--

Wheat:

Septoria nodorum was present in some fields in the southeastern states, but due to dry conditions and advanced plant maturity it should result in little loss.

Septoria tritici was severe on a single heavily fertilized wheat field near Skidmore, Texas, but elsewhere in south Texas it was light in early April.

Soil borne mosaic has been severe in central and south-central Kansas since February.

Powdery mildew was light during the early spring throughout most of the South. It has been reported severe in some commercial fields in South Carolina.

Oats: Septoria foliage blight was moderate in the southeastern states. A few local scattered areas of oat red leaf were also observed. Powdery mildew was observed on oats in a Uvalde County, Texas nursery.

CEREAL RUST BULLETIN

Report No.: 2
Date: May 25, 1976

EAL RUST LABORATORY
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. DEPARTMENT OF AGRICULTURE
VERSITY OF MINNESOTA, ST. PAUL 55108

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

The maturity of the small grain cereal crops is a week earlier than normal in the southern half of the USA. Harvest is well underway in Texas and parts of southern Oklahoma. The rains in late April and May in these areas came too late for the wheat, have delayed harvest, and allowed weeds and late tillers to be a serious problem in some areas. Freeze damage to small grains has been reported in many states. The freeze severely damaged 10% of the fields in eastern Kansas, with the three counties of Franklin, Douglas, and Miami reporting 50% of the fields damaged. Most of the spring cereals in the upper Midwest were planted 1-2 weeks earlier than normal but drought conditions in some areas have slowed crop development.

Wheat stem rust.--Conditions during early May were excellent for spread of stem rust on late tillers and fields in Texas and southern Oklahoma. Stem rust overwintered in a commercial field in northern Stephens Co., Texas (30% severity). Traces were observed in commercial fields in McCulloch, Concho, San Saba, Callahan, Denton, and Grayson Counties of Texas, and Calhoun Co., South Carolina. Severities on plots of susceptible varieties in Uvalde, Frio, and Hardeman Counties, Texas reached 30% (Gilmore). Races have been identified from the collections received before April 26 as follows:

Location	No. of collections	Wheat stem rust CRL races (no. of isolates)
Beeville, TX	6	QFB(15), TNM(3)
Divot, TX	1	TNM(3)
Pearsall, TX	1	TNM(2), RKQ(1)
Robstown, TX	2	TDM(5), QSH(1)
S. Batesville, TX	1	TNM(3)
Three Rivers, TX	1	TDM(1)
Obregon, Mexico	14	RKQ(25), RTQ(20), TLM(3), QFB(2)

The number of stem rust collections is far less than normal for this time of year, which may be due to dry weather that occurred in March and April in the southern wheat-growing areas of the country.

Wheat leaf rust.--Leaf rust was light and scattered in early May in north-central Texas. Currently, leaf rust can be found in trace amounts in most Kansas fields. In 1976 leaf and stem rust losses in Kansas will be negligible (Eversmeyer). Leaf rust is also present in trace amounts in Virginia (Bawden), Brookings, South Dakota (Buchenau), and the Pacific Northwest (Line). Leaf rust was also reported severe on some soft winter wheat varieties in Illinois (Jacobsen).

Wheat stripe rust.--Stripe rust is quite prevalent in the Pacific Northwest and will cause significant losses on certain susceptible varieties in some areas (Line). In Washington state two different stripe rust races cause losses on the varieties Paha and Yamhill. The acreage planted to these varieties has decreased this year because of previous rust losses. In California stripe rust is severe in experimental plots and light in commercial fields.

Oat stem rust.--Oat stem rust existed in trace amounts in Lampasas, Callahan, and Cooke Counties in north-central Texas by early May. Many collections from susceptible varieties were made in the Beeville nursery. Races identified from collections received prior to April 26 were as follows:

Location	No. of collections	Oat stem rust races (number of isolates)
Beeville, TX	6	31(12), 2(6)
Divot, TX	1	31(3)
Obregon, Mexico	2	31(1), 61(5)-Avena fatua(Host)

Oat crown rust.--Crown rust was nearly nonexistent in commercial fields in north-central Texas in early May. It is too early to project the development of this rust in the major production area of Iowa, Minnesota, Wisconsin, and the Dakotas. Aecia have developed on the buckthorns at St. Paul, Minnesota.

Barley leaf and stem rusts.--Leaf rust was observed only in trace amounts in nurseries at Chillicothe and Temple, Texas in early May, and no rust was found elsewhere in north-central Texas. Leaf rust was observed in trace amounts in Virginia (Hayes). The only report of stem rust this year is at Beeville, Texas.

Barberry rust.--Aecial collections have been received from Virginia (Saunders, Stuart, Callahan), West Virginia (Bostic), and Wisconsin (Keeler, Pruka, Bennet, Line). The earliest collections from Virginia were avirulent on all varieties of wheat, oats, barley, and rye tested.

Other diseases.--Septoria tritici is light to severe on the lower wheat leaves throughout Kansas. Losses from a trace to 5% can be expected, depending on the area (Eversmeyer). Powdery mildew in Kansas ranges from a trace to 20% on the lower leaves with a few pustules on flag leaves. A few fields of winter wheat in southern Minnesota were reported to be heavily infested with mildew. Soil-borne mosaic losses will be equal or greater than last year in Kansas. Wheat streak mosaic has been observed in a few central Kansas fields. Cephalosporium gramineum stripe on wheat is light to severe throughout the eastern two-thirds of Kansas, depending on tillage practices. Loose smut has been found in trace to 3% severities in Kansas (Eversmeyer). Barley yellow dwarf has been observed on wheat in trace amounts over the entire state of Kansas. Yields in several fields in the southern half of the state may be reduced by 50% (Eversmeyer). Barley stripe mosaic was observed in central Texas (McCulloch Co.) during early May. Fields in western Kentucky are expressing 50-70% barley stripe severities.

CEREAL RUST BULLETIN

Report No.: 3
Date: June 8, 1976

EAL RUST LABORATORY
CULTURAL RESEARCH SERVICE (ARS)
DEPARTMENT OF AGRICULTURE
ERSITY OF MINNESOTA, ST. PAUL 55108

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

Cool temperatures and rains have slowed small grain development in the hard red winter wheat area. The wheat harvest is in full swing in the southeastern U.S., slowed by rains in Texas and southern Oklahoma. Drought conditions continue to be a problem in western Kansas and the panhandles of Texas and Oklahoma. The upper Great Plains states are reporting dry conditions, with Minnesota reporting the driest spring on record. The small grains have all been planted in the northern states, and crop conditions are 1 week earlier than normal. Winter wheat maturity ranges from berry to soft dough in Kansas, anthesis to berry in Nebraska, and heading to anthesis in Minnesota.

Wheat stem rust.--Trace amounts of stem rust were found in northern Texas more frequently than in recent years, but rust is not severe enough to affect yields (Gilmore). Trace amounts are also present in commercial fields in Oklahoma, Kansas, and southern Nebraska. The highest severity noted in a commercial field was 3% in Tillman County, Oklahoma (Eversmeyer). Cool temperatures limited disease increase during May in Kansas. A field with stem rust infection centers was located in northern Kansas on May 24 (Goodfellow). Infection centers were also located on susceptible wheat varieties in Norton Co., Kansas; and Hitchcock and York Counties, Nebraska (Eversmeyer, Diehl). Light stem rust was reported in Darlington Co., South Carolina (Harrison) and Scotland Co., North Carolina (Newton). Wheat stem rust overwintered on an artificially inoculated winter rye plot at the University of Minnesota, St. Paul, and yielded races QFB, QSH, and TNM. The additional isolates identified from the few stem rust collections received in late April and early May were:

Location	No. of collections	Wheat stem rust CRL races (no. of isolates)
Calhoun Co., SC	1	QCB (3)
Uvalde, TX	5	RKQ (2), RTQ (6), TNM (6)
Obregon, Mexico	6	RKQ (4), RTQ (14)

(See Report No. 2 for earlier identifications.)

Wheat leaf rust.--Leaf rust is widespread in Illinois, western Kentucky, and eastern Missouri. Losses are expected on some of the soft winter wheat varieties in southwestern Illinois. Reports were received of 60% severity on Triumph-type varieties in southern Kansas, but the rust appeared too late to cause significant losses. Traces to 5% severities were reported on many fields in northern Kansas and southern Nebraska. Leaf rust was observed in wheat plots in trace amounts as far north as Brookings, South Dakota (Buchenau) and Rosemount, Minnesota.

Wheat stripe rust.--The weather was favorable for stripe rust development in the state of Washington. Fields of the two rust-susceptible varieties, Yamhill in western Washington and Paha in eastern Washington, have 90% severities (Line).

Oat stem rust.--Many stem rust collections were submitted from nurseries in Brazos (McDaniel) and Collins (Gardenhire) Counties in Texas. Stem rust was found in fields in Bexar and Denton Counties, Texas (Atkins), and Grant Co., Oklahoma (Goodfellow). Races identified since the last issue of the Cereal Rust Bulletin are as follows:

Location	No. of collections	Oat stem rust CRL races (no. of isolates)
Kendall Co., TX	1	77 (2), 94 (1)
Uvalde Co., TX	2	31 (3), 78 (2), 76 (1)
Lampasas Co., TX	1	61 (3)
Cooke Co., TX	1	31 (3)
Callahan Co., TX	1	31 (3)

Oat crown rust.--Aecia appeared on buckthorn in Dane and Rock Counties, Wisconsin and in the buckthorn nursery at St. Paul, Minnesota by the third week in May. Dry conditions retarded spread to surrounding oat fields.

Barley stem and leaf rusts.--Stem rust was reported in Darlington Co., South Carolina (Harrison) and Brazos Co., Texas (McDaniel). No additional reports of leaf rust have been received in the past 2 weeks.

Rye stem and leaf rusts.--Traces of leaf rust were found in Monroe Co., West Virginia and Ramsey Co., Minnesota. No reports of rye stem rust were received.

Barberry rust.--Aecial collections were submitted from additional West Virginia Counties: Summers, Greenbrier, and Monroe (Fulk, Bostic). A number of aecial collections were submitted from Wisconsin Counties: Dane, Dodge (Line), and Grant (Keeler, Bennett). An aecial collection was made at the Centre Co., Pennsylvania oat rust nursery (Albright). In Olmsted Co., Minnesota pycnia were observed May 24, and aecia were collected June 1 (Laudon). Pycnia were reported the first week of May in Winona Co., Minnesota and Grant Co., Wisconsin.

Other diseases.--Take-all (Ophiobolus graminis) is scattered throughout Kansas in trace amounts. Wheat streak mosaic and soil-borne mosaic were found in Illinois. Barley yellow dwarf was observed on wheat in Georgia (Cunfer). Powdery mildew is common on winter wheat and winter rye at St. Paul, Minnesota.

CEREAL RUST BULLETIN

Report No.: 4
Date: June 23, 1976

REAL RUST LABORATORY
ICULTURAL RESEARCH SERVICE (ARS)
. DEPARTMENT OF AGRICULTURE
VERSITY OF MINNESOTA, ST. PAUL 55108

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

Wet weather delayed the small grain harvest during the past 2 weeks in Oklahoma and northern Texas. Recent hot dry weather has forced the ripening of the small grain crop as far north as southern Nebraska. This week the harvest will be in full swing in southern Kansas. Moderate losses are now evident due to the early May freeze in northeastern Kansas. Spring grains vary from flowering in western Minnesota to mid dough in eastern Nebraska. Moisture is badly needed in the drought-stricken grain-growing areas of southwestern Minnesota and South Dakota. Many small grain fields will not recover in this area even if rain does fall within the next week.

Wheat stem rust.--Trace to 3% severities were widespread across Kansas and southern Nebraska commercial fields. In Clay Center, Nebraska and Stockton, Kansas 60% severities were observed on plots of the highly susceptible McNair 701. In county agent demonstration plots throughout northern Kansas, trace severities were present on Eagle, Scout, and Centurk; and 5-10% severities on Trison, Kirwin, Parker, and Triumph 64. Infection centers with 2% severities were observed in two commercial fields in York and Hitchcock Counties, Nebraska. The stem rust level in Kansas and Nebraska is greater than last year, but stem rust will cause only trace losses in most commercial fields. In northwest Missouri 30% severities were reported in a few wheat fields in the hard dough stage. Stem rust was found in trace amounts in Rosemount, Minnesota spring wheat test plots.

Preliminary results of the 1976 wheat stem rust race survey (6/22/76).

Location	No. of collections	Number of isolates of each race								
		15				151			11-32-113	
		TNM	TLM	TDM	TBM	QFB	QSH	QCB	RKQ	RTQ
South Carolina	1							3		
Texas	42	51	6	10	1	17	10	1	6	8
Obregon, Mexico	22	2	3			3			31	35

Wheat leaf rust.--Leaf rust is present in trace amounts in Indiana, Michigan, Minnesota, North Dakota, Ohio, South Dakota, Virginia, Wisconsin, and the Nebraska panhandle. In Kansas leaf rust will cause some losses on late-maturing wheat. Severities in east-central Nebraska commercial fields range from a trace to 20% at the soft to mid dough stage.

Oat stem rust.--Collections were received from nurseries in Kendall and Bell Counties, Texas (McDaniel). Scattered stem rust has been found in fields in central Kansas (Eversmeyer) and southeastern Nebraska (Baker). No stem rust has been found in the major oat-producing states of the Dakotas, Iowa, Minnesota, or Wisconsin. With the oats now past heading throughout most of this area, no major threat from stem rust exists. Oat stem rust spreading from barberry was reported this year on June 8 in the Uniform Rust Nursery in Centre County, Pennsylvania.

Preliminary results of the 1976 oat stem rust race survey (6/22/76).

Location	No. of collections	No. of isolates of each race					
		2	31	61	76	77	78
South Texas	41	22	76	16	2	7	2
West Virginia	1*					2	
Obregon, Mexico	2		1	5			

* Barberry aecial collection.

Oat crown rust.--Traces of crown rust were observed in Illinois, Indiana, Kansas, Michigan, Ohio, and Wisconsin. No crown rust was observed early last week in western Iowa. Traces of crown rust were observed on oats at Rosemount, Minnesota last week, and on the most susceptible cultivars prevalence varies from 20-60%. Although crown rust will increase rapidly in southeastern Minnesota, losses will be light in fields planted at the normal time. Elsewhere, rains have been inadequate for rapid disease increase.

Barley leaf and stem rusts.--Traces of leaf rust are common on commercial barleys as far north as central Minnesota. Dry weather and advanced crop maturity will prevent losses in this area. Scattered stem rust was reported in a winter barley nursery in south-central Kansas (Heyne).

Rye stem and leaf rusts.--Trace amounts of stem rust were reported on rye in West Virginia (Bostic), North Carolina (Newton), and central Kansas. Rye leaf rust was reported in moderate amounts in West Virginia and in trace amounts in Michigan (Smith) and Minnesota.

Triticale stem rust.--Collections were received from nurseries in Hale and Deaf Smith Counties, Texas (Jenkins).

Barberry rust.--Aecial collections were submitted from additional Minnesota counties: Goodhue, Fillmore, Wabasha, and Winona. Additional collections were received from Centre and Susquehanna Counties, Pennsylvania. The first Minnesota collections have been identified as Puccinia graminis f. sp. secalis.

Other diseases.--Trace to 3% severities of loose smut of wheat occur throughout much of the grain-growing area of Kansas, Minnesota, Nebraska, and Wisconsin. Take-all (Gaumannomyces graminis) and various other root rots have affected wheat in southern Nebraska and eastern/central Kansas. Barley yellow dwarf that appeared on wheat late in the season in the central Great Plains is now common as far north as central Minnesota. Septoria is present in trace amounts, but most of the firing of leaves is due to hot dry weather.

CEREAL RUST BULLETIN

Report No.: 5
Date: July 7, 1976

om:
EREAL RUST LABORATORY
GRICULTURAL RESEARCH SERVICE (ARS)
. S. DEPARTMENT OF AGRICULTURE
NIVERSITY OF MINNESOTA, ST. PAUL 55108

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

Wet weather and late tillers are creating some harvesting problems in northern Kansas with the wheat harvest moving into southern Nebraska. Dry conditions have forced many farmers in Minnesota and South Dakota to plow their small grain fields under. In areas where moisture is short the grains are ripening faster--than normal. Limited amounts of small grains were being harvested in south-central Minnesota this week. The small grain crop in most of North Dakota and Montana is in good condition.

Wheat stem rust.--Traces of stem rust are now present in commercial fields in northern and western Nebraska, but no losses are expected. Collections were received during the past 2 weeks from Illinois, Indiana, Iowa, Michigan, Oklahoma, and Pennsylvania. In east-central Colorado moderate stem rust severities were observed in local centers in some fields (Helbig). In West Virginia and Pennsylvania infection centers were found in late-maturing varieties, such as Blueboy, in the soft dough stage (Bostic, Snelbaker, Bingaman, Wagner). The only report of stem rust in South Dakota was in the Uniform Rust Nursery at Brookings (Buchenau). In the N.D.S.U. plots at Fargo, natural stem rust inoculum arrived June 11 and traces of disease were found June 23, but the rust has not increased since. In the Casselton, North Dakota experimental plots stem rust severities ranged from a trace to 10% on the winter wheats (Miller). Traces of stem rust are present on wild barley (Hordeum jubatum) in southern Minnesota. Preliminary data from the early part of the race survey show race 15-TNM to be the most prevalent race in the southern Great Plains (Table 1).

Table 1. Preliminary results of the 1976 wheat stem rust race survey (7/6/76).

Location	No. of collections	Number of isolates of each race								
		15				151			11-32-113	
		TNM	TLM	TDM	TBM	QFB	QSH	QCB	RKQ	RTQ
Kansas	12	25		1			1			1
North Carolina	1							3		
Oklahoma	7	10		6				3		
South Carolina	10	1						27		
Texas-North	2	3					3			
Texas-South	59	68	6	16	1	32	11	1	9	14
Coahuila, Mexico	3	5				1				3
Obregon, Mexico	22	2	3			3			31	35

Wheat leaf rust.--Leaf rust is generally light throughout the wheat-growing areas. Susceptible winter wheat varieties are moderately rusted as far north as St. Paul, Minnesota and Minot, North Dakota. Leaf rust remains light in commercial hard red spring wheat fields due to the resistance of the varieties. In the Pacific Northwest leaf rust is generally light but could be a problem in irrigated fields or areas of plentiful moisture.

Wheat stripe rust.--There is more stripe rust than in recent years in Washington (Line). In fields of the cultivars Paha and Yamhill, 20% losses are expected. There are also high levels of stripe rust on varieties with non-specific resistance that are temperature-sensitive in their response to rust (such as Nugaines). Stripe rust increases when temperatures are cool, and thus little further disease increase is expected with the normal rise in temperatures (Line).

Oat stem rust.--The first oat stem rust collection in Iowa was made June 30 in Boone County (Baker). Collections were received from Kansas, Minnesota, Nebraska, South Carolina, and the Uniform Rust Nursery in Centre Co., Pennsylvania. This year oat stem rust will not be a problem in the major oat-producing states of the Dakotas, Iowa, Minnesota, and Wisconsin. The preliminary results of the oat stem rust race survey are shown in Table 2. Races 31 and 61 continue to be the most common.

Table 2. Preliminary results of the 1976 oat stem rust race survey (7/6/76).

Location	No. of collections	Number of isolates of each race							
		1	2	31	61	76	77	78	87
Pennsylvania	1*								3
North Texas	35	9		32	63				
South Texas	53	9	22	95	19	2	8	2	
West Virginia	1*						2		
Wisconsin	1*			1					
Obregon, Mexico	2			1	5				

* Barberry aecial collection.

Oat crown rust.--Crown rust remains light throughout the central states. Traces were observed in Indiana, Michigan, Minnesota, Ohio, and Pennsylvania fields. The crown rust spread from the St. Paul campus buckthorn nursery is very light this year due to hot dry weather and low humidity during the nights.

Barley stem and leaf rusts.--Barley stem rust collections were made in University experimental plots at Mead, Nebraska and Rosemount, Minnesota. Barley leaf rust is light to moderate in southeastern Pennsylvania, and traces are present in east-central Minnesota.

Rye stem and leaf rusts.--Rye stem rust was observed in many West Virginia counties, and single collections were made in Greenbrier Co., West Virginia, Waukesha Co., Wisconsin, and Washington Co., Minnesota. Traces of rye leaf rust were noted in Michigan, Minnesota, Virginia, and Wisconsin commercial fields.

Triticale stem rust.--Collections were made in the University of Nebraska experimental plots at Mead, Nebraska.

Barberry rust.--Additional aecial collections were submitted from Hennepin Co., Minnesota and Ozaukee Co., Wisconsin (Baumgartner). The first Washington state aecial collection was made July 1 (Miller). Stem rust collections of Hordeum jubatum and Agropyron repens were made within 15 feet of a barberry bush in Hennepin Co. (Laudon).

CEREAL RUST BULLETIN

Report No.: 6
Date: July 20, 1976

From:
CEREAL RUST LABORATORY
AGRICULTURAL RESEARCH SERVICE (ARS)
U. S. DEPARTMENT OF AGRICULTURE
UNIVERSITY OF MINNESOTA, ST. PAUL 55108

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

Small grains throughout North Dakota, Montana, and northern Minnesota are making good progress, while drought-stressed crops in southern Minnesota and South Dakota are rapidly maturing. Abandonment of small grains in eastern South Dakota and southwestern Minnesota is much higher than normal because of continuing drought conditions. The North Dakota winter wheat harvest has started this week in the southeast, and in the north the spring grains are in the late milk to early dough stages. Montana spring grains are rated mostly in good condition and range from late berry to early milk in maturity.

Wheat stem rust.--Stem rust in the spring wheat area is present in trace amounts and has increased slowly due to the drought. In winter wheats from Montana to Ohio, the dry weather and advanced growth stage will prevent any further disease increase. Some of the collections received in the past 2 weeks were made in experimental field plots in Tippecanoe Co., Indiana (Finney); Dickey Co., North Dakota (Miller); Brookings Co., South Dakota (Wells); and Dakota and Waseca Counties, Minnesota. Rust severities of these collections ranged from 5-80%, while trace severities were observed on commercially grown varieties in these states. Preliminary data from the wheat stem rust race survey is shown in Table 1.

The recent hot weather has caused several single gene lines for some of the best resistances to react more susceptibly than usual, i.e. Sr 22, 24, 25, 26, Gt, and a gene in Waldron. These are not thought to be new races, but cooperators are requested to make collections from varieties and lines with these sources of resistance. Single gene lines with Sr Tt-1 and Wst are more resistant than expected. The race survey has detected an increase in the frequency of a variant of race 15-TNM virulent on sr 17.

Table 1. Preliminary results of the 1976 wheat stem rust race survey (7/20).

Location	No. of collections	Number of isolates of each race										
		15				151			11-32-113		17-29	
		TNM	TLM	TDM	TBM	QFB	QSH	QCB	RKQ	RTQ	HJC	HNL
Ind.	2								1			3
Kans.	66	139	3	13		2	2	3		4		
Nebr.	17	43		4			2					
N.C.	1	1										
Okla.	34	55	1	10		1		3	1		1	
S.C.	9	1						24				
Texas--N.	41	55	6	8	1		19		8	6		
Texas--S.	14	21		6		11	1		3	6		
Coahuila, Mexico	5	6				2			2	4		
Obregon, Mexico	20		2			3			28	32		

Wheat leaf rust.--Resistant varieties plus unfavorable environmental conditions are the main reasons for little rust this year. Trace amounts were reported on winter wheats in Iowa, Michigan, Minnesota, South Dakota, and Wisconsin. Severity readings of 0-80% were recorded on single gene lines for leaf rust at Rosemount,

Minnesota. No leaf rust was reported on commercial durum varieties in the north-central states.

Oat stem rust.--Trace amounts of stem rust are present in Iowa and Minnesota. Additional stem rust collections were made in commercial fields in Fillmore, Dodge, and Goodhue Counties, Minnesota that had up to 20% severities. Collections were made in experimental plots in Tippecanoe Co., Indiana (Whittaker), and McLeod and Sibley Counties, Minnesota (Laudon, Schlick, Schulz). Under hotter than normal conditions, stem rust spread faster in the inoculated nursery at St. Paul, Minnesota than crown rust. A difference observed in the oat stem rust race survey has been a reduction in the prevalence of race 61 in south Texas, where it was the major component last year (Table 2).

Table 2. Preliminary results of the 1976 oat stem rust race survey (7/20).

Location	No. of collections	Number of isolates of each race								
		1	2	7	31	61	76	77	78	94
Kansas	4				5	7				
Nebraska	1				3					
Oklahoma	1					3				
Texas--North	70	19	3	3	75	90		1		
Texas--South	45		21		77	20	2	7	2	

Oat crown rust.--Traces of crown rust were found in Iowa, Michigan, Minnesota, Pennsylvania, and West Virginia fields this past week. Severities on oat lines in the St. Paul Campus buckthorn nursery ranged from traces on selected resistant breeding stocks to 100% on the more susceptible commercial varieties.

Barley stem and leaf rusts.--Barley stem rust collections from commercial fields were made in Clay, Dakota, Goodhue, Scott, and Sibley Counties, Minnesota and Barnes and Grand Forks Counties, North Dakota. Rust on susceptible varieties in a commercial variety nursery at Rosemount, Minnesota ranged from trace to 60%. Due to the advanced stage of crop maturity, there were no reports of barley leaf rust during the past 2 weeks.

Rye stem and leaf rusts.--Rye stem rust collections were made in commercial fields in Brookings Co., South Dakota (Helbig), and Sherburne and Washington Counties, Minnesota (Schulz). Early collections from Minnesota, North Carolina, and West Virginia have been identified mostly as Puccinia graminis f. sp. secalis.

Barberry rust.--Aecial collections were submitted from Whitman Co., Washington (Miller). Barberry collections made in late spring were identified as oat stem rust: race 87, Pennsylvania; race 77, West Virginia; and race 31, Wisconsin. A Dane Co., Wisconsin aecial collection was identified as wheat stem rust race 29-HJC.

Other stem rust collections.--Hordeum jubatum (wild barley) collections were made in Blue Earth, Carver, Goodhue, Sibley, and Waseca Counties in Minnesota (Laudon, Schulz), and Cass Co., North Dakota (Goodfellow, Fitchett, Jons). The rusted collection of Hordeum jubatum received June 23 from Hennepin Co., Minnesota was identified as Puccinia graminis f. sp. secalis. The only stem rust collection from Phleum pratense (Timothy) to date this year was made in Rice Co., Minnesota (Laudon, Schulz). Collections of stem rust from Dactylis glomerata (orchard grass) were made in Ramsey Co., Minnesota.

Other diseases.--Ergot was observed in field plots of rye, wheat, and barley at Rosemount, Minnesota. Loose smut is a problem in many Minnesota and Wisconsin oat fields; in some Minnesota fields, one-third of the heads were destroyed.

CEREAL RUST BULLETIN

Report No.: 7
Date: August 3, 1976

om:
EREAL RUST LABORATORY
GRICULTURAL RESEARCH SERVICE (ARS)
. S. DEPARTMENT OF AGRICULTURE
NIVERSITY OF MINNESOTA, ST. PAUL 55108

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

Throughout Minnesota, Montana, and North Dakota the small grain harvest is advancing ahead of schedule. Scattered fields of winter wheat and barley have been harvested as far north as the Canadian border. Dry weather caused some deterioration of spring-sown small grains in parts of North Dakota and northern Minnesota, but generally the crop is in good shape. Spring wheat maturity varies from hard dough to ripe in southern North Dakota, and late milk to soft dough in northern North Dakota.

Wheat stem rust.--Stem rust occurred in trace amounts in scattered commercial wheat fields in Michigan, Minnesota, Montana, North Dakota, Washington, and Wisconsin. Rust buildup will still occur in the northern fields but no loss will result. In some eastern Montana (Helbig) and eastern Washington (Delegans) fields, occasional rusted plants could be found with severities varying from trace to 40%. Severities on susceptible spring wheats in nurseries varied as follows: 60%, Dakota Co. and 40%, Marshall Co., Minnesota; 60%, Foster Co. and 40%, Ward Co., North Dakota. Susceptible nursery winter wheat severities varied from 3% at Venango Co., Pennsylvania (Shiner) to 50% at Isabella Co., Michigan (Clayton). Table 1 gives the preliminary results of the 1976 wheat stem rust race survey.

Hordeum jubatum, bearded wild barley, is rusted throughout North Dakota and northwest Minnesota. Severities and prevalence vary, with the most rust along the northern Red River Valley area between North Dakota and Minnesota.

Table 1. Preliminary results of the 1976 wheat stem rust race survey (8/3).

Location	No. of collections	Number of isolates of each race										
		15				151			11-32-113			56
		TNM	TLM	TDM	TBM	QFB	QSH	QCB	RCC	RKQ	RTQ	MBC
Colo.	5	13		2								
Ind.	1									1		
Iowa	1	3										
Kans.	107	234	5	17	1	6	5	3			4	
Mich.	1	3										
Minn.	2	3	3									
Mo.	7	11		4		2			1		1	
Nebr.	40	87	7	9		4	7		3	2	3	1
N. D.	1	3										
Penn.	1					1		1				1
S. D.	1			2		1						
Va.	1							3				
W. Va.	3	1				1		6				1

* For southern states and Mexico, see earlier reports.

Wheat leaf rust.--Leaf rust is generally light and scattered in commercial fields. Severities of 60% were observed in a few eastern Montana and Washington fields. In varietal field plots, severities ranged from trace to 60% throughout Montana, North Dakota, and Minnesota. A 60% severity at soft dough was observed on rust-susceptible Baart, and a 3% severity was observed on Waldron in the same varietal plots.

Oat stem rust.--Trace amounts of stem rust were observed in Iowa, Minnesota, North Dakota, Pennsylvania, and Wisconsin commercial fields. Stem rust is present in trace amounts on wild oats (Avena fatua) throughout North Dakota and Minnesota. In fields of ripe oats, rust generally is present on the green tillers. Races 31 and 61 continue to be the most important races in the Great Plains (Table 2).

Table 2. Preliminary results of the 1976 oat stem rust race survey (8/3).

Location*	No. of collections	Number of isolates of each race							
		1	31	61	86	87	89	94	96
Kansas	6		10	8					
Nebraska	5		12	3					
Pennsylvania**	10		1		1	13	3	8	1
S. Carolina	2	1		5					

* See earlier reports for southern states and Mexico.
** Uniform Oat Rust Nursery associated with barberry.

Oat crown rust.--Traces of crown rust were observed in commercial fields in Minnesota, North Dakota, and Wisconsin. Crown rust severity readings in North Dakota and Montana varietal field plots ranged from a trace to 3%, which is less than last year.

Barley stem and leaf rusts.--Traces of stem rust are present on commercial barleys from western Minnesota to northeastern Montana. No stem rust losses occurred in any fields observed in this area. Leaf rust was observed in trace amounts in a few northern North Dakota fields. A stem rust collection from Kansas winter barley was identified as race TNM.

Rye stem and leaf rusts.--Rye stem rust collections were made in commercial fields in Wayne and Erie Counties, Pennsylvania (Sporer, Palisin). Races identified from collections received in June were: QDC, QFB, RKQ, Illinois; TNM, Kansas; QCB, Minnesota; and TLM, Wisconsin.

Triticale rust.--Collections from two northern Texas small grain nurseries were identified as race TNM.

Barberry rust.--The only aecial collections submitted in the past 2 weeks were from Whitman Co., Washington (Shaw, Ellis). Races identified from June aecial collections in Minnesota and Wisconsin were RKQ, QSH, and TLM. Races 87 and 94 were identified from aecial collections made in the barberry nursery associated with the Pennsylvania Uniform Oat Rust Nursery.

Other stem rust collections.--In Goodhue Co., Minnesota stem rust spread was traced from Berberis vulgaris to Agropyron repens and Agrostis alba (Laudon, Schulz). Additional stem rust collections of Phleum pratense were made in Hennepin Co., Minnesota (Laudon, Schlick, Schulz).

CEREAL RUST BULLETIN

Report No.: 8
FINAL ISSUE
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From:
CEREAL RUST LABORATORY
AGRICULTURAL RESEARCH SERVICE (ARS)
U. S. DEPARTMENT OF AGRICULTURE
UNIVERSITY OF MINNESOTA, ST. PAUL 55108

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

The small grain harvest in the northern U.S. is in the final stages. Combining has begun in the northern areas of Minnesota, Montana, North Dakota, and Wisconsin, with early reports of variable yields and quality.

Wheat stem rust.--Few collections were received from the southeastern U.S. wheat-growing areas this year. This probably was due to dry conditions limiting stem rust development during March and April. In South Texas stem rust was the lightest in years because of dry weather. In spite of the severe spring drought, scattered light rains and warm temperatures permitted stem rust to occur in northern Texas, Oklahoma, and Kansas. The disease level was insufficient to result in losses except for a few scattered fields of very susceptible varieties in north-central Kansas and south-central Nebraska. A severe drought in eastern South Dakota and southwestern Minnesota prevented rust development. Elsewhere in South Dakota and southern Minnesota, only traces of rust developed. In Montana and the northern parts of North Dakota and Minnesota, stem rust severities were light due to: 1) the early crop maturity, 2) drier than normal conditions, and 3) resistant varieties.

The preliminary results of the wheat stem rust race survey are shown in Table 1. Several hundred collections were received in the past 2 weeks from Minnesota, North Dakota, and Washington that are yet to be identified. Race 15-TNM has been the most commonly identified race (67% of the isolates) this year, compared to 68% in 1975 and 52% in 1974. Race 15B-TDM has been the second most commonly identified race (10%) to date in 1976. In recent years the latter race has been increasing as race TLM decreased. Race 151-QSH increased in 1975 to 4, 19, and 11% of the isolates from Kansas, Nebraska, and Oklahoma, respectively. This year QSH has returned to the 1974 levels of 2, 5, and 0% of the isolates from Kansas, Nebraska, and Oklahoma, respectively. No new races with adequate virulence to be hazardous to small grains have been detected to date in 1976, although there has been an increase in the portion of 15-TNM virulent on Sr 17. This gene occurs in Scout, Sage, Centurk, and many other Hope-derived varieties. Fortunately, most of these varieties have additional genes for stem rust resistance that will protect them from this culture. The seedling resistance of Sr 13, 22, 24, 25, 26, 27, Wst from Webster, Gt from Gamut, Tt-2 from Triticum timopheevi, and an undesignated gene from Iumillo have been effective against 1976 collections to date. The major spring wheat varieties Waldron, Era, and Olaf remain resistant.

Oat stem rust.--Stem rust occurs in trace amounts in Minnesota and Wisconsin commercial fields at crop maturity. Preliminary results of the oat stem rust survey are shown in Table 2. As in previous years, races 31 (6AF) and 61 (7F) constitute over 80% of the collections identified to date. The majority of the identified collections are from Texas; most of the collections from Minnesota, North Dakota, and Wisconsin were received within the past 2 weeks and have not been identified. Races 87, 89, and 94 were identified from collections made in the Penn. State University Uniform Oat Rust Nursery associated with barberry.

Seedling resistance to races 31 and 61 is provided by pg-9 and pg-13. The seedling resistance of CI 9221, CI 9139, CI 8457, Kyto, and Saia have been effective against all 1976 cultures to date. Losses due to stem rust in the north-central states will be light due to a low level of initial infection, early planting, and the abnormally dry season.

Table 1. Preliminary data of the 1976 wheat stem rust race survey (8/16).

State	No. of collections	% of isolates of the most common races									
		15			151			11-32-113			56
		TNM	TDM	TLM	QCB	QFB	QSH	RCC	RKQ	RTQ	MBC
Colorado	5	87	13								
Indiana	2				33	33			33		
Iowa	1	100									
Kansas	107	85	6	2	1	3	2			1	
Michigan	1	100									
Minnesota	15	69	14	14		3					
Missouri	7	58	21			11		5		5	
Nebraska	45	68	12	5		3	5	3	1	2	1
North Carolina	1				100						
North Dakota	8	76	24								
Oklahoma	45	73	16	2	3	1			2	1	1
Pennsylvania	4	12			12	38	12		12		12
South Carolina	9	4			96						
South Dakota	8	71	25			4					
Texas--North	45	54	7	6		1	19	1	7	5	
Texas--South	16	44	13			23	2		6	12	
Virginia	1				100						
West Virginia	4	8			75	8					8
Subtotal (1976)	324	67	10	3	6	4	4	1	2	2	1
Total--1975	759	68	5	3	8	2	9	*	1	1	1
Total--1974	914	52	2	13	4	10	3	*	2	1	3

* Trace

Table 2. Preliminary data of the 1976 oat stem rust race survey (8/16).

State	No. of collections	% of isolates of each race							
		1	2	7	31	61	76	77	78
Iowa	8				91	9			
Kansas	6				56	44			
Minnesota	13				61	39			
Nebraska	5				75	25			
Oklahoma	2					100			
South Carolina	2	17				83			
Texas--North	66	5	2	2	33	58			
Texas--South	55	6	12		59	14	2	5	2
Subtotal (1976)	157	5	6	1	49	37	*	2	*
Total--1975	542	1	*	0	73	25	0	*	0
Total--1974	362	1	1	0	76	9	0	0	0

* Trace

Barley stem rust.--Stem rust is heavier than in previous years on 6-row barley in Whitman Co., Washington (Delegans). The resistance of Larker is the best among the commercial cultivars grown in the north-central states. No losses due to barley stem rust occurred in the latter area in 1976.

Other stem rust collections.--Stem rust was reported on Dactylis glomerata (orchard grass) in Monroe Co., West Virginia (Bostic) and Ramsey Co., Minnesota. Stem rust was reported on Agropyron repens (quackgrass), Agrostis alba (redtop), Hordeum jubatum (wild barley), and Phleum pratense (timothy) in Hennepin Co., Minnesota (Laudon, Schlick, Schulz). Trace amounts of stem rust occurred on Arrhenatherum elatius (tall oat grass) and Elymus canadensis (Canadian wild rye) in Ramsey Co., Minnesota.