

CEREAL RUST BULLETIN

Report No. 1
Date: May 8, 1973

CEREAL RUST LABORATORY

UNIVERSITY of MINNESOTA, ST. PAUL, 55101

PLANT PROTECTION PROGRAMS, APHIS, and PLANT SCIENCE RESEARCH DIVISION, ARS,
U. S. DEPARTMENT OF AGRICULTURE

J. B. Rowell, Leader (Res. Plant Pathologist)
W. R. Bushnell, Res. Plant Physiologist
M. G. Eversmeyer, Res. Plant Pathologist

D. V. McVey, Res. Plant Pathologist
A. P. Roelfs, Res. Plant Pathologist
P. G. Rothman, Res. Plant Pathologist

Winter sown small grain cereal crops are in good to excellent condition. Moisture is adequate to surplus, a condition that has existed since planting time. Winter temperatures in the southern states were colder than normal and spring freezes caused minor losses in Texas across northern and central Texas except in the Abilene area where some fields were severely damaged. Wheat maturity in central Texas varies from late boot to mid-dough depending on time of planting; thus, harvest will be one to two weeks later than normal.

Spring sown grains are much later than normal in the central Great Plains and earlier than normal in the northern Great Plains.

Wheat stem rust.--Stem rust was reported in commercial fields in south Texas (Maddox) and Freeport, Florida (Barnett). It was severe enough to kill susceptible varieties in plots at Beeville, Texas. Elsewhere in nurseries, moderate amounts of stem rust were observed at Baton Rouge, Louisiana; light amounts at Poplarville, Mississippi and Stuttgart, Arkansas; and traces at Iowa Park and Seymour, Texas. Additional moderate stem rust was reported in a nursery near Shreveport, Louisiana (Tipton). Thus, stem rust is further north than at this time in 1972; however, severities are generally much lighter, especially as wheat in southern Alabama and western Florida were severely rusted in 1972. Stem rust will be much lighter than last year in the southeastern USA. A buildup in a few late fields in north-central Texas is expected.

Wheat leaf rust.--Leaf rust is generally light east of the Mississippi River; however, at two nursery locations, Henery County (Gudauskas) and Dalles County in Alabama, leaf rust severities were moderate to heavy. Losses will be light in the southeastern states. Leaf rust is severe in scattered fields in Arkansas, north Texas, and southwestern Oklahoma. Losses of 5-10% will occur in these fields, although many fields will suffer no losses. Losses approaching 15% were predicted for northwest Oklahoma, 4-6% for western and southwestern Oklahoma, and none for north-central Oklahoma (Young, Raymunds, Celik).

Wheat stripe rust.--Severe stripe rust was observed in small centers in the McKinney-Sherman, Texas area (Gardenhire). By May 5, leaves were dead and dry so the rust was difficult to find.

Oat stem rust.--Oat stem rust overwintered at Beeville and College Station, Texas and at Hope and Rohwer, Arkansas. Currently, moderate severities occur only at Beeville. At Hope and Rohwer several rusted stems were found.

Oat crown rust.--Crown rust was light to moderate in south and east-central Texas and Arkansas through Alabama but present in only trace amounts in Georgia, Florida, and north-central Texas.

Barley rusts.--No stem rust was observed except on Tambar 401 at Beeville, Texas. Leaf rust was moderate to severe from Texas through Alabama, an amount much greater than normal. It was present in light to trace amounts in Georgia, Florida, and Arkansas.

Rye rusts.--No stem rust was observed, and leaf rust was scattered but severe at Beeville and Seymour, Texas.

Triticale rusts.--The only stem rust observed was on FasGro 131 at Beeville. Leaf rust was generally light and scattered.

Rusted barberry.--A lightly rusted bush (aecia) was reported in Smyth County, Virginia (Saunders). Pynica were noted on a bush in Center County, Pennsylvania (Keim).

Other diseases of importance on an area basis were septoria leaf spot of wheat which was severe in south Texas and light to moderate elsewhere in Texas, and helminthosporium leaf spot which was moderate to severe on all small grain cereals in southern Alabama and western Florida.

CEREAL RUST BULLETIN

Report No. 2

Date: June 5, 1973

CEREAL RUST LABORATORY

UNIVERSITY of MINNESOTA, ST. PAUL, 55101

PLANT PROTECTION PROGRAMS, APHIS, and PLANT SCIENCE RESEARCH DIVISION, ARS,
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J. B. Rowell, Leader (Res. Plant Pathologist)
W. R. Bushnell, Res. Plant Physiologist
M. G. Eversmeyer, Res. Plant Pathologist

D. V. McVey, Res. Plant Pathologist
A. P. Roelfs, Res. Plant Pathologist
P. G. Rothman, Res. Plant Pathologist

Prospects for a good winter wheat crop continue. Harvest is late and recent rains in Texas and southern Oklahoma will further delay the harvest. Only 10 to 20% of the fields in north-central Texas and southern Oklahoma have been harvested and many of the remaining fields will require one to two weeks of dry weather. The southern tier of counties in Kansas and spots in the Pacific Northwest are the major areas requiring some rain to maintain good crop conditions. Spring sown crops in Kansas, Missouri, and Oklahoma are several weeks late. In the northern plains cereals are still ahead of normal and harvest should be early, with the exception of a few reseeded fields.

Wheat stem rust.--Stem rust is now present from Kansas southward in trace amounts. Cool weather has apparently slowed rust development; however, the crop itself may be as much as two weeks late. Scattered very late fields in north-central Texas and west-central Oklahoma have 5-10% stem rust at a week from maturity. Heavy rust is expected in a few fields and in green spots of others where the wheat is still in the milk stage. It is also anticipated that stem rust will become generally light in north-central Kansas. A single collection of stem rust was received from Hartsville, South Carolina (Harrison). The source of this inoculum is unknown, as there have been no reports of stem rust from Georgia or Alabama and only from one field in Florida. The early data from the race survey is shown in Table 1. Again, as in previous years, a major difference exists in the races found in south Texas and Mexico, from those found further north in the Great Plains. Of major importance in the South is the absence of race 15 and the preponderance of race groups 11-32-113 and 151. The latter contain some potentially dangerous cultures. Stem rust uredospores were trapped in rain water at St. Paul, Minnesota during the periods of May 10-14 and May 23-31; thus, we will be watching for stem rust to appear in this area during the next week.

Wheat leaf rust.--Leaf rust severities are variable throughout Kansas but currently range from trace to 70% on flag leaves, with the area of highest severities generally in central and west south-central Kansas. Throughout most of extreme southern Kansas and southward most of the leaves have dried. Traces of leaf rust were reported in southern Nebraska in mid-May (Palmer), and in Colorado on June 1 (Watson). Leaf rust was found on winter wheat from the field at St. Paul, Minnesota that had been transplanted in the greenhouse on May 11. The source of this inoculum has not been determined. We have had reports of heavy leaf rust in northern Alabama (Sharma), moderate severities throughout Louisiana (Tipton), and trace amounts in Illinois, Virginia, South Dakota, and Missouri.

Wheat stripe rust.--Stripe rust was observed in mid-May in central Kansas and was reported to have been severe in a variety test plot in north-central Oklahoma. Stripe rust occasionally appears on the Great Plains, but the disastrous epidemics that it causes are normally limited to areas with cool moist climates. Thus, stripe rust is expected to disappear in the Great Plains with the return to more normal rainfall and temperature conditions.

Oat stem rust.--Stem rust is widespread in moderate amounts across central and north-central Texas. In this area late fields will have terminal severities from 1-5%. Stem rust in trace amounts was observed as far north as northern Oklahoma where the oats are just in the milk stage (Goodfellow). Most of the collections identified so far in the race survey are from south Texas. Races 15, 31, 61,

72, 77, and 98 have been identified. Races 15, 77, and 98 are virulent on pg-9, a source of resistance to race 31, the most common race in recent years. These races are also virulent on pg-13 that has been resistant to almost all USA cultures.

Oat crown rust.--Crown rust is light to moderate in Texas and Oklahoma. It could become severe in Kansas, Missouri, and Nebraska, where oats were planted later than normal. It is too early to project the development of this rust in the major production area of Minnesota and the Dakotas. Aecia have developed on buckthorn at St. Paul, Minnesota. Crown rust in light amounts was reported in Georgia (Tipton) and Virginia (Hoyos).

Barley stem rust.--Less stem rust has been reported on barley than in 1972. This may be due in part to a light early inoculum load and to a hot dry wind which prematurely dried barley in the southern Great Plains.

Barley leaf rust.--Leaf rust is also less common in Kansas and Oklahoma than in 1972; however, it was moderate to severe in north-central Texas at crop maturity. Light amounts of barley leaf rust have also been reported in Virginia (Hoyos) and West Virginia (Bostic).

Rye stem rust.--No stem rust has been reported on rye.

Rye leaf rust.--Leaf rust is reported to be moderate to heavy throughout the southern Great Plains.

Barberry rust.--Aecia collections have been received from Iowa (Kruse), Pennsylvania (Albright, Chancy, Maxwell), Virginia (Callahan, Jones, Norris), West Virginia (Bostic, Fulk), and Wisconsin (Line). Several of the earliest collections from Virginia were avirulent on all varieties of wheat, oats, barley, and rye tested. Pycnia incidence was light in southeast Minnesota (Laudon, Schlick, Bennett).

Septoria leaf spot continues to be reported in moderate severities in Kansas and Oklahoma, where some loss will occur. Septoria is wide-spread in Nebraska (Palmer). Light to moderate severities of septoria were also reported in Illinois (Komanetsky) and Indiana (Shaner).

Table 1. Preliminary results of the 1973 wheat stem rust survey (6/5/73).

Area	No. of coll.	No. of iso.	% of isolates of each race group and the predominate virulence code ^{1/} in the group								
			11-32-113	15	17	151	Other				
Sonora, Mex.	38	114	68	RKQ	0	0	32	QFB	0		
Nuevo Leon, Mex.	8	32	18	RTQ	0	0	77	QSH	5 MCB		
South Texas ^{2/}	29	85	13	RKQ	0	24	HDB	63	QSH	0	
North Texas	3	9	0		100	TNM	0	0	0		
Louisiana	5	15	33	RHR	47	TNM	13	HDB	7	QFB	0
Mississippi	2	4	100	RKQ	0	0	0	0	0		
Florida	1	3	0		33	TNM	0	67	QFB	0	

^{1/} Cereal Rust Laboratory code, see Plant Dis. Repr. 56: 1038. Set III consists of Sr Tt-1, 9b, 13, and 10.

^{2/} Counties in Texas entirely south of the 30° parallel.

CEREAL RUST BULLETIN

Report No. 3
Date: June 26, 1973

CEREAL RUST LABORATORY

UNIVERSITY of MINNESOTA, ST. PAUL, 55101

PLANT PROTECTION PROGRAMS, APHIS, and PLANT SCIENCE RESEARCH DIVISION, ARS,
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W. R. Bushnell, Res. Plant Physiologist
M. G. Eversmeyer, Res. Plant Pathologist

D. V. McVey, Res. Plant Pathologist
A. P. Roelfs, Res. Plant Pathologist
P. G. Rothman, Res. Plant Pathologist

Winter wheat harvest is underway in Kansas. The harvest is late in Kansas but should be nearer normal time in Nebraska and South Dakota. Crop prospects are excellent. Soil moisture is becoming short but without unusually hot or windy weather the winter crops will not suffer. The leaves of many spring cereals in South Dakota are rapidly drying and the crops will head out just above knee-high in much of eastern South Dakota. General rains are needed.

Wheat stem rust.--Stem rust continues lighter than in 1972. Dry weather and cool nights have limited the disease increase in Kansas. Only traces of stem rust were found in Nebraska. Based on observations of field plots, it is deduced that the rust is predominantly race 15-TN. Stem rust was found on winter wheat at St. Paul on June 7 as predicted from spores found in rain water. Stem rust has been reported on wheat in Virginia (Callahan, Saunders) and in the barberry area of West Virginia. It appears that little stem rust will occur in much of the spring wheat area in 1973, even in plots of susceptible varieties.

Wheat leaf rust.--Leaf rust reached severities of 10-100% in northern Kansas and parts of southeast and south-central Nebraska. Losses in this area will vary from a trace on the varieties Gage and Centurk to 1-2% for Scout, and up to 5% for the Triumph, Bison, and Parker types. Only traces of leaf rust were found in winter wheat fields of the Nebraska panhandle and in spring and winter wheats in south-central, central, and east-central South Dakota. With the premature drying of the leaves of the spring wheats, little leaf rust should develop in South Dakota. Leaf rust on winter wheat in Minnesota ranges from 5-20% severity at milk stage. Leaf rust was found on winter wheat at Fargo on June 6 (Statler and Miller). Trace to light amounts of leaf rust have been reported throughout most of the northern soft red winter wheat area. A period of hot weather has caused wheat to develop rapidly in part of this area. Leaf rust is prevalent in Virginia (Callahan and Saunders).

Wheat stripe rust.--Stripe rust probably has been stopped by warm temperatures; however, it was reported as far north as McCook, Nebraska (Doupnik).

Oat stem rust.--The only new area of stem rust infection is a spread from barberry in Pennsylvania (Keim). With most of the spring oats in boot to flowering stages, no major development of oat stem rust is expected.

Oat crown rust.--Crown rust is present in only trace amounts; however, it is present as far north as St. Paul where secondary infections are developing. Some spread from buckthorn has been observed in Iowa (Kruse) and Indiana (Komanetsky). Aecia were noted in Pennsylvania (Keim) and Wisconsin (Line, Keeler, and Langlie).

Barley leaf and stem rusts.--No rust was observed on barley in Minnesota, South Dakota, or Nebraska. With most of the spring barley in this area heading, no losses from leaf rust are expected. Leaf rust was reported on barley in Virginia (Saunders and Tate).

Rye stem and leaf rusts.--Only traces of leaf rust were observed in South Dakota and Minnesota, and no stem rust was observed. South Dakota's rye appears in excellent condition. Leaf rust was reported to be light in Pennsylvania (Keim), West Virginia (Bostic), and in Wisconsin (Line, Keeler, and Langlie).

Barberry rust.--A mid-May collection (by Callahan) of aecia from barberry in Virginia was oat stem rust race 76 (1H); this differs from the race 76 from south Texas in its virulence on pg-13. Most of the aecia collections received at the Laboratory are viable but result in resistant reactions on wheat, an immune reaction on Marvellous oats, and an intermediate reaction on Hipoly barley and Prolific rye. A stem rust spread to blue grass was reported in Wisconsin. A rusted barberry was found in Washington State (Hendrix).

Other diseases.--Septoria leaf spot is moderately severe on wheat in eastern Nebraska. Both Septoria tritici and nodorum are moderately severe in Indiana (Shaner and Scott). Helminthosporium is present in light amounts on wheat in several southwestern Nebraska counties (Palmer and Douppnik). Loose smut is present in many Nebraska wheat fields with severities up to 0.5% common. One field was reported with a 5% infection (Palmer and Douppnik). This could be an important disease next year if this crop is used for seed. Loose smut of barley is common in South Dakota and one field was observed with a 5-10% infection. Take-all is moderate to severe in much of the Indiana wheat (Huber).

CEREAL RUST BULLETIN

Report No. 4
Date: July 10, 1973

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W. R. Bushnell, Res. Plant Physiologist
M. G. Eversmeyer, Res. Plant Pathologist

D. V. McVey, Res. Plant Pathologist
A. P. Roelfs, Res. Plant Pathologist
P. G. Rothman, Res. Plant Pathologist

A bumper wheat crop is nearly harvested in Kansas. Although strong winds and in some areas rains caused lodging in Nebraska, prospects are for a good crop. The spring cereal crops have suffered some from drought, hot winds, and weeds; however, prospects remain for a good crop.

Wheat stem rust.--Stem rust continues to be lighter than in 1972. Trace amounts were reported from Nebraska and South Dakota through Pennsylvania and Virginia. Wheat stem rust severities in Virginia and West Virginia have increased to 50% on the varieties Blueboy, Thorne, and Reed. The variety Arthur is resistant (Bostic). Stem rust was found on June 21 at Casselton, North Dakota on Minter winter wheat (Miller). Rust severity in a plot of susceptible winter wheat has reached 40% near St. Paul, Minnesota. Only a few stem rust collections have been received from commercial spring wheat fields, with light severities and trace prevalence. Table 1 is the preliminary results of the 1973 wheat stem rust survey. Of note is the expected predominance of the race 15B-2 TNM and TLN group in the hard red winter wheat area. These cultures are avirulent on the spring wheats. Race 151 QSH results in a moderately susceptible reaction on the spring wheats, except for Selkirk, Fortuna, Waldron, and Era which are resistant. Race 11-32 RKQ and RTQ result in similar responses. Fortunately, most of the hard red winter wheats are resistant to these races and probably screen against them in the population. Race 151 QFB is virulent only on some of the soft red winter wheats.

Wheat leaf rust.--Leaf rust reached 60% severity in commercial northeast Nebraska fields. All varieties except Gage were fully susceptible. Gage was moderately susceptible. In South Dakota leaf rust severities are moderate. Leaf rust is increasing on spring wheats, and light amounts have been observed on Chris and Era in Minnesota. With most spring wheat in the milk stage, leaf rust losses should be light. In the soft red winter wheat area of Virginia and West Virginia, leaf rust is heavy on Blueboy. Elsewhere, leaf rust remains light as the winter wheat crop matures.

Oat stem rust.--Trace amounts of oat stem rust have been reported from southeastern South Dakota through western Virginia. All observers report low prevalence and light severities. Preliminary results of the race survey (Table 2) show that race 61 predominated in the winter oat area. This race is avirulent on most commercial spring oat varieties, as are races 72, 76, 77, and 98 which occurred in the South. It is expected that race 31 is the race currently increasing in commercial spring oat fields. No losses are expected from this amount of rust.

Oat crown rust.--Crown rust is lighter than in recent years. Its appearance was generally later than normal and the crop was generally earlier. During the past week severities have become moderate in the area of Minnesota eastward. Losses are expected to be light.

Barley stem and leaf rusts.--Stem rust has been reported in Pennsylvania (Palisin), West Virginia (Bostic), and at St. Paul, Minnesota. It is expected to increase as the barley matures. No losses are expected. Leaf rust is now increasing on the later maturing barleys in Minnesota; however, at this stage of crop maturity, no loss would be anticipated.

Rye stem and leaf rusts.--Stem rust of rye has been reported from several fields in Virginia, Pennsylvania, West Virginia, and a single Minnesota field (Skovmand). Leaf rust is present in light to moderate amounts from Minnesota eastward. No losses from stem rust are expected, and only light losses in local areas from leaf rust are anticipated.

Barberry rust.--In most of the eastern USA the aecia cups on barberry have dried. Collections have been received from Whitman County, Washington. This county was the site of a barberry spread to wheat and barley in 1972.

Other diseases.--Wheat in Indiana has been seriously effected by several diseases: Septoria tritici, southern 1/2 of state, 10% loss (Shaner); Ophiobolus graminis, 1/10 of the fields severely affected, 80% loss, 1/3 of the fields moderately affected, 20% loss (Huber). Gibberella zeae is severe in some fields (Shaner). Barley yellow dwarf is locally severe in some fields of Clintland and Clintland 64 oats in Indiana (Shaner). Wheat stem maggot is unusually severe in southwestern and south-central Minnesota wheat fields with severities up to 10-30%; in central Minnesota severities were 1-2% (Lofgren).

Table 1. Preliminary results of the 1973 wheat stem rust survey (7/10/73).

Area	No. of coll.	No. of iso.	% of isolates of each race						
			15B-2	11-32	17	151	151	Others	
			TNM	RKQ	HDB	QFB	QSH		
			TLM	RTQ	HNB				
Arkansas	1	3					100		
Florida	1	3	33				67		
Kansas	26	56	78				11	5	5
Louisiana	7	19	37	16		10	16		21
Mississippi	2	4		100					
Nebraska	1	3	100						
Oklahoma	26	73	81	4	1	11		3	
South Carolina	2	4		100					
Texas (South)*	36	105		10	18	10		48	15
Texas (North)	46	126	52	3		28		15	1
Virginia	1	3					100		

* Texas counties completely south of the 30th parallel.

Table 2. Preliminary results of the 1973 oat stem rust survey (7/10/73).

Area	No. of coll.	No. of iso.	% of isolates of each race								Others
			31	61	72	76	77	87	94	98	
Arkansas	3	9	100								
Pennsylvania	4	4						75	25		
Oklahoma	4	9	100								
Texas	61	161	29	50	4	2	4			9	1

CEREAL RUST BULLETIN

Report No. 5

Date: July 24, 1973

CEREAL RUST LABORATORY

UNIVERSITY of MINNESOTA, ST. PAUL, 55101

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W. R. Bushnell, Res. Plant Physiologist
M. G. Eversmeyer, Res. Plant Pathologist

D. V. McVey, Res. Plant Pathologist
A. P. Roelfs, Res. Plant Pathologist
P. G. Rothman, Res. Plant Pathologist

Drought conditions continued throughout much of the upper Great Plains. The majority of the hard red spring wheat, spring barley, spring oats, and durum wheat are grown here. Scattered showers and subsoil moisture were adequate to prevent a serious crop loss. However, harvesting has started several weeks early throughout this area. Yields are lower than expected and some grain shriveling has occurred. A small acreage of small grains has been cut for hay.

Wheat stem rust.--Stem rust in the spring wheat area is present in trace amounts and has not increased due to the drought. Races have been identified from 116 Kansas collections. Race 15 TNM comprised 78%, race 15 TLM 10%, and race 151 QFB 6% of the Kansas isolates. The race 15 group has increased in prevalence in the eastern USA with a corresponding decrease of race 151 QFB.

Wheat leaf rust.--The resistant wheats Waldron, Agatha, and Transfer were immune at St. Paul, Minnesota; however, light to moderate amounts of rust were observed on Era. The durum variety Leeds was also resistant.

Oat stem rust.--Stem rust occurs in trace amounts throughout Iowa, Minnesota, and the eastern Dakotas. Most fields are now maturing due to dry weather, and no rust build-up will occur.

Oat crown rust.--Crown rust became moderate in Minnesota before the drought halted rust development. Losses due to crown rust were light.

Barley stem rust.--Traces of stem rust were observed on barley at maturity. This may be either Puccinia graminis f. sp. tritici or f. sp. secalis. No loss was incurred.

Barley leaf rust.--Leaf rust caused little if any loss in the spring barley area. Barley was planted early and the following dry weather caused a further shortening of the growing season, making conditions for leaf rust development less favorable than normal.

Rye stem and leaf rusts.--Several fields of winter rye were observed in east-central Minnesota with a 1-5% severity and 50-70% prevalence of stem rust. This amount of rust at maturity should not cause significant losses. Leaf rust is now heavy on the few scattered plants with some remaining green leaves.

CEREAL RUST BULLETIN

Report No. 6--FINAL

Date: August 7, 1973

CEREAL RUST LABORATORY

UNIVERSITY of MINNESOTA, ST. PAUL, 55101

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M. G. Eversmeyer, Res. Plant Pathologist

D. V. McVey, Res. Plant Pathologist
A. P. Roelfs, Res. Plant Pathologist
P. G. Rothman, Res. Plant Pathologist

The commercial small grain cereal crop is past the stage where losses from the cereal rusts could occur. However, some rust is present in oat fields planted for hay late in the season and the regrowth in some recently harvested fields.

Wheat stem rust.--The wheat stem rust survey is approximately 70% completed with 756 isolates identified. Race 15B-2 TNM (39%) predominated among the USA isolates. Race 151 QFB (20%) is the second most common as in 1972. Other common races are 151 QSH, 11% of the isolates; 15B-2 TLN, 11%; race 11-32-113 RKQ, 3%; race 11-32-113 RTQ, 2%; and race 17 HDB, 2%. Most of the isolates of QSH occurred in south Texas (Table 2) and most of the TLN races occurred in Oklahoma, Kansas, and Nebraska. Thus, on the completion of the survey, TLN will probably be the third most common group of isolates. The most common races in each state are shown in Table 2. The percentage of the USA isolates virulent on 12 selected single gene lines is shown in Table 3.

Oat stem rust.--Approximately 20% of the anticipated isolates have been identified. Current results show 53% of the isolates are race 61 (7F) and 32% are race 31 (6AF). Note that 175 of the 257 isolates identified are from Texas. It is anticipated that race 31 will predominate among the isolates from the northern spring oat rust collections. Thus, race 31 is expected to remain the predominate race in 1973. The results from the first 256 isolates identified are shown in Table 1. Pg-2 offers resistance to races 61, 72, 77, and 98.

Barley and Rye rusts.--Insufficient collections have been received from commercial fields to make any statement concerning races identified from barley. In general, the isolates of *Puccinia graminis* f. sp. *secalis* have been less virulent on Prolific spring rye than usual. Some collections of rye stem rust have produced infection types from 0; to 2⁻ on some of the single gene wheat differentials. Hi-proly barley and Line E, Little Club x Gabo³/Charter, a wheat developed by Dr. I. A. Watson of Australia, have been susceptible to all isolates of rye stem rust.

Table 1. Preliminary results of the 1973 oat stem rust race survey (8/7/73).

State	No. of isolates	% of isolates of the most common races							
		31	61	72	76	77	87	94	98
Arkansas	9		100						
Iowa	9	67	33						
Kansas	6		100						
Minnesota	9	67	33						
Nebraska	20	40	60						
Ohio	6		100						
Oklahoma	9		100						
Pennsylvania	4						75	25	
South Dakota	3	100							
Texas	175	32	48	2	2	3			11
Virginia	3	33	33		33				
West Virginia	4	75	25						

Table 2. Preliminary results of the 1973 wheat stem rust race survey (8/7/73).

State or area	No. of isolates	% of the isolates of the most common CRL race ^{a/}
Arkansas	3	QFB 100%
Florida	3	QFB 67%, TNM 33%
Illinois	3	TLM 100%
Iowa	4	TNM 75%, QSH 25%
Kansas	141	TNM 74%, QFB 10%, TLM 8%
Louisiana	19	TNM 37%, QFB 3%, RHR 3%, HDB 2%
Minnesota	44	TNM 50%, TLM 18%, RKQ 11%, QSH 3%
Mississippi	4	RKQ 100%
Nebraska	50	TNM 38%, TLM 32%, QFB 10%
Ohio	18	QFB 39%, TNM 33%, RTQ 17%
Oklahoma	72	TNM 50%, TLM 23%, QFB 10%
Pennsylvania	12	TNM 42%, QFB 33%
South Carolina	3	RKQ 100%
South Dakota	2	TNM 100%
Texas		
South ^{b/}	109	QSH 51%, HDB 15%, QFB 12%, RKQ 11%
Central ^{c/}	49	QSH 39%, QFB 37%, RTQ 5%, TNM 4%
Northeast ^{d/}	17	QFB 53%, QCB 17%, TNM 2%
Northwest ^{e/}	86	TNM 76%, QFB 9%, TLM 7%, RKQ 2%
Virginia	56	QFB 61%, TNM 14%, TLM 9%
Washington	6	RBC 50%
West Virginia	48	QFB 52%, QCB 17%, TNM 14%, TLM 10%
Wisconsin	7	TNM 28%, QFB 1%, TLM 1%

^{a/} CRL race = standard race: R-- = 11-32-113; T-- = 15; H-- = 17; Q-- = 151.

^{b/} Counties entirely south of the 30° parallel.

^{c/} Burleson County.

^{d/} Collin, Denton, and Grayson Counties.

^{e/} Archer, Baylor, Childress, Hardeman, Knox, Wichita, Wilbarger, and Young Counties.

Table 3. Percent of USA wheat stem rust isolates virulent on selected single gene lines.

SR gene	1973	1972
5	96	99
9d	97	97
dlv	50	54
7b	62	73
11	66	63
6	19	26
8	82	90
9a	42	45
Tt-1	58	--
9b	11	--
13	.03	--
10	65	--