CEREAL RUST BULLETIN

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From:

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- Wheat stem rust race Pgt-QCCJ, which is virulent on all currently grown barley cultivars, is now well established in Texas where overwintering conditions are consistently favorable for its continued survival in the Great Plains.

Winter wheat harvest is in full swing throughout northern Kansas and southern Nebraska. In much of this area, yields and test weights were reported to be below normal because of disease and weather related factors. In the spring-sown small grains, in the Upper Midwest, the hot dry weather in late June accelerated plant growth. Now with a return to more typical July weather, small grains are developing at a more normal pace, but maturity differences between tillers in the same field may vary from 1-2 weeks.

Wheat stem rust. During late June, 10% stem rust severities were found in northeastern and northwestern Kansas plots of McNair 701 at the hard dough stage. The hot dry weather in June was not conducive to rust increase.

In early July, traces of stem rust were found in a hard red winter wheat plot in southeastern North Dakota and in a field in west central Wisconsin. Since only light amounts of stem rust were found in the central Great Plains, wheat stem rust is not expected to be a problem on susceptible wheats in the northern Great Plains.

To date, race Pgt-TPMK is the predominant stem rust race identified in 1995; in 1994 it was the predominant race identified in the U.S. Race Pgt-RCRS was not found in Texas in 1994, but this year it comprises almost 50% of the isolates identified from Texas (Table 1). Race Pgt-QCCJ (which infects barley) was identified from stem rust collections made in nurseries in central Texas and northwestern Arkansas.

Wheat leaf rust. In late June, in northwestern Kansas and south-central Nebraska fields, the hot dry weather had prematurely dried many leaves on wheat plants, but on the few remaining green leaves 40% leaf rust severities were common. In this area losses will vary with local conditions, but some fields will suffer losses in yield of greater than 5%.

In mid-June, leaf rust was present in light amounts in winter wheat fields in eastern Wisconsin. The hot dry weather in late June had dried the leaves prematurely and thereby restricted rust development.

During early July 20-60% severities were observed in southeastern North Dakota winter wheat plots and fields at soft dough stage. Only traces were observed on lower leaves in spring wheat plots and fields at early milk growth stage.

During the last week in June, the aecial stage of leaf rust was found on meadow rue (*Thalictrum flavum*) growing in the Rio Grande National Forest in south-central Colorado. The form of leaf rust found has not been determined, but it is most likely a form that attacks some wild grasses but not wheat.

The wheat leaf rust races identified so far in the 1995 survey are presented in Table 2. There have been no major changes in races identified so far this year compared to last year.

TABLE 1. Wheat stem rust races identified through July 10, 1995

	Number of		Number of isolates of Pgt race*			
State	collections	isolates	QCCJ	RCMS	RCRS	TPMK
AR	3	9	3			6
LA	4	11				11
NC	1	3				3
SC	1	3				3
TX	12	29	3	3	13	10

* Virulence formula:

QCCJ - *Sr*5,21,9g,17,9d,10
RCMS - *Sr*5,21,7b,9g,36,17,9a,9d,10
RCRS - *Sr*5 ,21,7b,9g,36,9b,17,9a,9d,10
TPMK - *Sr*5,21,9e,7b,11,8a,9g,36,17,9d,10,Tmp

Wheat stripe rust. Wheat stripe rust was light in Bozeman, Montana plots during late June. No new reports on stripe rust have been received from Washington or Oregon.

Oat stem rust. During the last week in June, 2% oat stem rust severities were observed in a northeastern Indiana nursery. This was the first report of oat stem rust found outside of Texas in 1995.

The first detection of oat stem rust in the northern central plains this year was during the first week in July when traces of oat stem rust were found on wild oat (*Avena fatua*) plants growing alongside the road in southeastern North Dakota. Currently, it appears that oat stem rust should not cause a problem in the northern oat-growing area. Race NA-27 is again the predominant oat stem rust race identified; races NA-16 and -5 have also been identified so far in 1995. These are the same races identified in 1994.

Oat crown rust. During early July, trace to 60% crown rust severities were found on the flag leaves in oat plots in east-central Minnesota. In early July, crown rust was light in southern Wisconsin but severe

in eastern South Dakota. The incidence of virulence for 1995 crown rust isolates tested to date is presented in Table 3.

Barley stem rust. In early July, barley stem rust was reported for the first time in the northern barley growing area as traces in a southeastern North Dakota field. Traces of barley stem rust were also found on wild barley(*Hordeum jubatum*) growing alongside a road in southeastern North Dakota.

Barley leaf rust. In early July, 5% barley leaf rust severities were observed in varietal plots in south-central Minnesota.

Barley stripe rust. There have been no new reports of barley stripe rust since Cereal Rust Bulletin #6.

Rye rusts. During the first week in July, 60% rye leaf rust severities were observed on winter rye flag leaves and 10% severities were observed on spring rye flag leaves in east central Minnesota varietal plots. There have been no new reports of rye stem rust.

Rust on barberry. During the last week in June, rust aecia were found on leaves of barberry (*Berberis fendleri*) bushes growing along a trail in the Rio Grande National Forest in south-central Colorado. The rust has not been positively identified yet. It is probably not stem rust, but more likely is a species limited to wild grasses.

TABLE 2. Wheat leaf rust races identified through July 11, 1995

		Number of isolates by state*								
Prt code	Virulence formula	AL	AR	CA	FL	GA	IN	LA	SC	TX
CBG-10,18	3,10,11,18					2				
FBT-18	2c,3,3ka,11,17,18,30	1								
FCD-10	2c,3,10,17,26									2
MBG	1,3,11	6								
MBG-10	1,3,10,11	18	8	11	2	2		4		1
MBG-10,18	1,3,10,11,18					6				
MBJ-10	1,3,10,11,17									2
MBR-10	1,3,3ka,10,11,30	14	12	1				2	1	12
MCB-10	1,3,10,26									1
MCD-10	1,3,10,17,26									2
MCH-10	1,3,10,11,26,30			2						
MCR-10	1,3,3ka,10,11,26,30	3								5
MCR-10,18	1,3,3ka,10,11,18,26,30			3						
MDB-10	1,3,10,24									2
MDG-10	1,3,10,11,24		1							1
MDR-10	1,3,3ka,10,11,24,30									6
MFB-10	1,3,10,24,26									1
MGB-10	1,3,10,16									1
PBG-18	1,2c,3,11,18								2	
PBR-10,18	1,2c,3,3ka,10,11,18,30		2				2			
PNM-10,18	1,2c,3c,3ka,9,10,24,30		2							
PNR-10	1,2c,3,3ka,9,10,11,24,30	2								2
TBG	1,2a,2c,3,11	1								
TBG-10	1,2a,2c,3,10,11								1	3
TDB-10	1,2a,2c,3,10,24									2
TDG-10	1,2a,2c,3,10,11,24		1							7

TFB-10	1,2a,2c,3,10,11,24									7
TFG-10	1,2a,2c,3,10,11,24,26	3								
TLG-18	1,2a,2c,3,9,11,18	6			2	4			4	2
No. of isolates		54	26	17	4	14	2	6	8	59

* Near isogenic resistances evaluated: *Lr*1,2a,2c,3,3ka,9,10,11,16,17,18,24,26,30

TABLE 3. Incidence of virulence in 1995 oat crown rust isolates tested to date (7-11-95)

	Percent of isolates virulent		
Differential	AL, FL, GA	LA	TX
Pc 14	77	73	81
Pc 35	82	75	44
Pc 36	36	32	43
Pc 38	14	18	24
Pc 39	9	8	22
Pc 40	86	77	93
Pc 45	5	7	6
Pc 46	36	45	57
Pc 48	9	0	0
Pc 50	32	21	43
Pc 51	77	79	78
Pc 52	9	0	0
Pc 53	0	1	0
Pc 54	23	36	10
Pc 56	27	32	38
Pc 57	14	26	18
Pc 58 TAM-O-301	32	46	14
Pc 59 TAM-O-312	55	74	17
Pc 60 Coker 227	86	78	82
Pc 61 Coker 234	86	70	79
Pc 62	0	1	0
Pc 63	9	8	21
Pc 64	0	10	3
Pc 67	32	44	76
Pc 68	0	3	0
Pc 70	10	12	19
Pc 71	9	10	24
H548	5	1	0
Dane	5	3	6
WI X4361-9	5	7	1

TAM-O-386R	0	4	16
TAM-O-393	0	5	3
Mitchell	89	73	82
No. of isolates	22	73	68