

TBDJQ	1,2a,2c,3,17,10,14a,21,28	0	0	0	0	1	1.2	0	0	0	0	0	0	1	0.2
TBGJG	1,2a,2c,3,11,10,14a,28	0	0	0	0	1	1.2	0	0	0	0	0	0	1	0.2
TBJSB	1,2a,2c,3,11,17,B,10,14a	1	0.8	0	0	0	0	0	0	0	0	0	0	1	0.2
TBRFG	1,2a,2c,3,3ka,11,30,14a,18,28	2	1.6	0	0	0	0	0	0	1	1.1	0	0	3	0.6
TBRKG	1,2a,2c,3,3ka,11,30,10,14a,18,28	22	17.9	0	0	4	4.7	0	0	2	2.2	2	1.8	30	6.1
TCBJG	1,2a,2c,3,26,10,14a,28	0	0	0	0	0	0	0	0	0	0	2	1.8	2	0.4
TCDSB	1,2a,2c,3,26,17,B,10,14a	1	0.8	0	0	0	0	0	0	0	0	0	0	1	0.2
TCGJG	1,2a,2c,3,26,11,10,14a,28	3	2.4	0	0	0	0	0	0	0	0	0	0	3	0.6
TCJSB	1,2a,2c,3,26,11,17,B,10,14a	4	3.3	0	0	0	0	0	0	1	1.1	2	1.8	7	1.4
TCQJG	1,2a,2c,3,26,3ka,11,10,14a,28	0	0	0	0	0	0	0	0	0	0	3	2.7	3	0.6
TCRFG	1,2a,2c,3,26,3ka,11,30,14a,18,28	0	0	0	0	1	1.2	0	0	0	0	0	0	1	0.2
TCRKG	1,2a,2c,3,26,3ka,11,30,10,14a,18,28	16	13.0	0	0	9	10.6	0	0	2	2.2	0	0	27	5.5
TCTSB	1,2a,2c,3,26,3ka,11,17,30,B,10,14a	2	1.6	0	0	2	2.4	0	0	0	0	0	0	4	0.8
TDBGJ	1,2a,2c,3,24,10,28,39	0	0	0	0	1	1.2	1	1.4	2	2.2	3	2.7	7	1.4
TDBGQ	1,2a,2c,3,24,10,21,28	0	0	0	0	0	0	0	0	0	0	4	3.5	4	0.8
TDBJG	1,2a,2c,3,24,10,14a,28	0	0	0	0	0	0	1	1.4	1	1.1	2	1.8	4	0.8
TDBJJ	1,2a,2c,3,24,10,14a,28,39	0	0	0	0	0	0	0	0	0	0	1	0.9	1	0.2
TDBJQ	1,2a,2c,3,24,10,14a,21,28	0	0	0	0	0	0	3	4.3	0	0	2	1.8	5	1.0
TDBSB	1,2a,2c,3,24,B,10,14a	1	0.8	0	0	0	0	0	0	0	0	0	0	1	0.2
TDGJG	1,2a,2c,3,24,11,10,14a,28	0	0	0	0	1	1.2	0	0	0	0	0	0	1	0.2
TDPSB	1,2a,2c,3,24,3ka,17,30,B,10,14a	0	0	0	0	0	0	1	1.4	0	0	1	0.9	2	0.4
TFBGJ	1,2a,2c,3,24,26,10,28,39	0	0	0	0	0	0	0	0	1	1.1	0	0	1	0.2
TFBJQ	1,2a,2c,3,24,26,10,14a,21,28	0	0	0	0	0	0	0	0	1	1.1	0	0	1	0.2
TFKDB	1,2a,2c,3,24,26,11,17,30,14a	0	0	0	0	2	2.4	0	0	0	0	0	0	2	0.4
TFKNB	1,2a,2c,3,24,26,11,17,30,B,14a	0	0	0	0	1	1.2	0	0	0	0	0	0	1	0.2
TFPSB	1,2a,2c,3,24,26,3ka,17,30,B,10,14a	1	0.8	0	0	1	1.2	0	0	0	0	0	0	2	0.4
TJBJG	1,2a,2c,3,16,24,10,14a,28	0	0	0	0	0	0	0	0	0	0	1	0.9	1	0.2
TNBJG	1,2a,2c,3,9,24,10,28,39	0	0	0	0	1	1.2	5	7.2	17	18.3	16	14.2	39	8.0
TNBJJ	1,2a,2c,3,9,24,10,14a,28,39	2	1.6	0	0	1	1.2	5	7.2	6	6.5	2	1.8	16	3.3
TNRJJ	1,2a,2c,3,9,24,3ka,11,30,10,14a,28,39	4	3.3	0	0	0	0	0	0	0	0	0	0	4	0.8
TPBGJ	1,2a,2c,3,9,24,26,10,28,39	0	0	0	0	0	0	1	1.4	2	2.2	3	2.7	6	1.2
TPBJJ	1,2a,2c,3,9,24,26,10,14a,28,39	0	0	0	0	0	0	0	0	2	2.2	0	0	2	0.4
TPRJJ	1,2a,2c,3,9,24,26,3ka,11,30,10,14a,28,39	1	0.8	0	0	0	0	0	0	0	0	0	0	1	0.2
Total		123	7	85	69	93	113	490							

^a Lines tested were Thatcher lines with genes *Lr1*, *Lr2a*, *Lr2c*, *Lr3*, *Lr9*, *Lr16*, *Lr24*, *Lr26*, *Lr3ka*, *Lr11*, *Lr17*, *Lr30*, *LrB*, *Lr10*, *Lr14a*, *Lr18*, *Lr21*, *Lr28*, *Lr39* and *Lr42*.

^b States of AL, AR, GA, LA, MS, NC, SC, TN, VA.

^c State of NY.

^d States of IL, IN, MI, eastern MO, OH, WI.

^e States of OK, TX

^f States of CO, IA, KS, western MO, NE.

^g States of MN, ND, SD

Table 2. Number and frequency (%) of isolates of *Puccinia triticina* in the United States in 2013 virulent to 20 lines of wheat with single resistance genes for leaf rust resistance.

Resistance gene	Area 1 ^a		Area 2 ^b		Area 3 ^c		Area 4 ^d		Area 5 ^e		Area 6 ^f		Total	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Lr1	123	100.0	7	100.0	84	98.8	69	100.0	89	95.7	112	99.1	484	98.8
Lr2a	63	51.2	2	28.6	30	35.3	24	34.8	51	54.8	64	56.6	234	47.8
Lr2c	63	51.2	3	42.9	31	36.5	33	47.8	55	59.1	75	66.4	260	53.1
Lr3	121	98.4	5	71.4	84	98.8	67	97.1	88	94.6	112	99.1	477	97.3
Lr9	7	5.7	2	28.6	2	2.4	15	21.7	35	37.6	23	20.4	84	17.1
Lr16	1	0.8	0	0.0	1	1.2	0	0.0	4	4.3	2	1.8	8	1.6
Lr24	12	9.8	0	0.0	9	10.6	31	44.9	41	44.1	47	41.6	140	28.6
Lr26	54	43.9	3	42.9	27	31.8	20	29.0	20	21.5	28	24.8	152	31.0
Lr3ka	107	87.0	3	42.9	69	81.2	27	39.1	31	33.3	26	23.0	263	53.7
Lr11	110	89.4	2	28.6	72	84.7	3	4.3	16	17.2	8	7.1	211	43.1
Lr17	70	56.9	4	57.1	61	71.8	47	68.1	42	45.2	51	45.1	275	56.1
Lr30	105	85.4	2	28.6	72	84.7	25	36.2	30	32.3	18	15.9	252	51.4
LrB	69	56.1	3	42.9	59	69.4	37	53.6	39	41.9	46	40.7	253	51.6
Lr10	72	58.5	7	100.0	30	35.3	65	94.2	82	88.2	111	98.2	367	74.9
Lr14a	119	96.7	2	28.6	78	91.8	46	66.7	54	58.1	56	49.6	355	72.4
Lr18	41	33.3	2	28.6	15	17.6	0	0.0	5	5.4	3	2.7	66	13.5
Lr21	0	0.0	0	0.0	1	1.2	4	5.8	1	1.1	16	14.2	22	4.5
Lr28	54	43.9	5	71.4	25	29.4	32	46.4	56	60.2	71	62.8	243	49.6
Lr39	9	7.3	2	28.6	7	8.2	32	46.4	59	63.4	72	63.7	181	36.9
Lr42	0	0.0	0.0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total	123		7		85		69		93		113		490	

^a States of AL, AR, GA, LA, MS, NC, SC, TN, VA.

^b State of NY.

^c States of IL, IN, MI, eastern MO, OH, WI.

^d States of OK, TX

^e States of CO, IA, KS, western MO, NE.

^f States of MN, ND, SD