

附表 1 条锈病抗性表型鉴定及分子标记检测结果

Supplementary table 1 Evaluation of stripe rust resistance phenotypes and associated molecular markers

材料来源 Variety source	品种(系)名称 Variety (line) name	苗期(反应型) Seedling stage (infection type)		成株期(严重度) Adult plant stage (disease severity)		成株期(反应型) Adult plant stage (infection type)		Yr 9	Yr 15	Y 1	Y 1	Y 2	Y 2	Y 3	Y 8	Y 8	Y 8	Y 8	Yr 22	Yr 84
		CYR32	CYR34	GS-DS	XJ-DS	GS-IT	XJ-IT													
	Pirsabak-13	0	0	0	33	0	4	+	-	+	-	-	+	-	-	+	-	-	-	-
	Borluag-16	7	7	23	27	4	4	-	-	+	-	-	-	+	-	-	-	+	-	-
	Ufaq-2000	4	7	60	47	6	6	+	-	-	+	-	-	+	-	-	-	-	-	-
	Annag-17	7	7	57	40	5	4	-	-	-	+	-	-	+	-	-	-	-	-	-
	Gold-16	7	7	40	9	4	2	-	-	-	-	-	-	+	-	-	-	-	-	+
	Galaxy-13	1	0	27	27	3	3	-	-	-	-	-	-	+	-	+	-	-	-	-
	Millat-11	0	0	20	23	3	4	-	-	-	-	-	-	+	-	+	-	-	-	-
	Chakwal-50	7	7	27	43	4	5	+	-	-	-	-	-	-	-	+	-	-	-	-
	Fakhra-sarhad	7	7	2	21	1	4	-	-	+	-	-	-	+	-	-	-	-	-	-
国外品种(系) Foreign cultivars (lines)	9496	7	7	20	47	3	4	-	-	-	-	-	-	+	-	+	-	-	-	-
	10136	5	0	0	8	0	1	-	-	+	-	-	-	+	-	-	-	-	-	-
	10137	0	7	67	67	7	7	+	-	-	-	-	+	-	-	-	-	-	-	-
	Pakistan-13	7	7	33	22	4	4	-	-	-	-	-	-	+	-	-	-	-	-	-
	Punjab-11	7	1	40	53	4	5	-	-	-	-	-	-	+	-	-	-	-	-	-
	Lasani-08	0	4	40	67	4	6	-	-	-	-	-	-	-	-	+	-	-	-	-
	Faisalabad-08	7	7	20	70	3	6	-	-	-	-	-	-	+	-	-	-	-	-	-
	Kohistan-97	7	7	60	47	6	6	-	-	-	-	-	-	+	-	-	-	-	-	-
	Inqilab-91	7	4	22	32	4	4	-	-	-	-	-	-	+	-	-	-	-	-	-
	Lu26s	7	7	40	67	5	7	-	-	-	-	-	-	+	-	-	-	-	-	-
	9408	7	7	10	40	2	4	-	-	-	-	-	-	+	-	-	-	-	-	-

附表 2 已知基因分子标记的引物和 PCR 反应条件

Supplementary table 2 The primers and PCR reaction for the molecular markers of known stripe rust resistance genes

基因 Gene	标记名称 Marker	序列 Primer sequence (5' -3')	退火温度 T_m (°C)	目标条带 Positive allele size (bp)	标记类型 Marker type
<i>Yr9</i>	<i>AF1/AF4</i>	GGAGACATCATGAAACATTTG CTGTTGTTGGGCAGAAAAG	55	1500 (+)	Rye chromosome specific
	<i>P6M12P</i>	GTACTAGTATCCAGAGGTCACAAG CAGACAAACAGAGTACGGGC	60	250; 360 (+)	STS
<i>Yr15</i>	<i>Y15K1-F2/uhw301R</i>	GGAGATAGAGCACATTACAGAC TTTCGCATCCCACCTACTG	54	993 (+)	DM
<i>Yr17</i>	<i>VENTRIUP/LN2</i>	AGGGGCTACTGACCAAGGCT TGCAGCTACAGCAGTATGTACACAAAA	65	262 (+)	DM
<i>Yr18</i>	<i>csLV34</i>	GTTGGTTAAGACTGGTGATGG TGCTTGCTATTGCTGAATAGT	57	150 (+); 229 (-)	STS
	<i>L34DINT13R2/L34SPF</i>	ACTTTCCTGAAAATAATACAAGCA GGGAGCATTATTTTTTCCATCATG	58	751 (+)	Cssfr5
<i>Yr28</i>	<i>cib-Yr28M1</i>	ACAACCATGGGAATATCATCA GATCATGGATGGTATAATAAGAAC	55	449 (+)	STS
	<i>cib-Yr28M2</i>	TCCCAGAGCTGAGCTTGCT CTTGTCAGTGGCTCAGAAC	55	245 (+); 290 (-)	STS
<i>Yr29</i>	<i>Xwmc44</i>	GGTCTTCTGGGCTTTGATCCTG TGTTGCTAGGGACCCGTAGTGG	60	260 (+)	AFLP
	<i>Bac17</i>	CCCATGCTGACATGGCCACAT CTCTGCTCTTAGTAGTTGCC	60	500 (+)	—
<i>Yr30</i>	<i>TMFMN</i> (未发表) <i>TMFMN</i> (Unpublished)	—	—	—	—
	<i>Xgwm533</i>	AAGGCGAATCAAACGGAATA GTTGCTTTAGGGGAAAAGCC	58	120 (+)	SSR
<i>Yr80</i>	<i>KASP_53113</i>	TGTACAATGACTCCTCGACTAACA TGTACAATGACTCCTCGACTAACG GCCACGCAATATCACCATCG	—	—	KASP
<i>Yr81</i>	<i>KASP_3077</i>	ATCCAAAAGTAATTGGCAACAGGTTCA CCAAAGTAATTGGCAACAGGTTTCG TGTGGAGCGTGACAATGAGGAAGTT	—	—	KASP

<i>Yr82</i>	<i>KASP_13376</i>	TGTTGTGGCTCTACGGAGTTA TGTTGTGGCTCTACGGAGTTG CACCAAAACAACACTCACCG	—	—	KASP
<i>Yr86</i>	<i>K_7127</i>	TGATCGAGTGGGTGAGCTA TGATCGAGTGGGTGAGCTG GTCAAGTTTCTTCTTAGTTGACCG	—	—	KASP
<i>YrZH22</i>	<i>ZH904</i> (未发表) <i>ZH904</i> (Unpublished)	—	—	—	—
	<i>Z74</i> (未发表) <i>Z74</i> (Unpublished)	—	—	—	—
<i>YrZH84</i>	<i>M126</i> (未发表) <i>M126</i> (Unpublished)	—	—	—	—
	<i>M170</i> (未发表) <i>M170</i> (Unpublished)	—	—	—	—

DM: 显性标记; STS: 序列标志位点; AFLP: 扩增片段长度多态性; SSR: 简单重复序列标记; KASP: 竞争性等位基因特异性 PCR

DM: Dominant marker; STS: Sequence tagged sites; AFLP: Amplified fragment length polymorphism; SSR: Simple sequence repeats; KASP: Kompetitive allele-specific PCR