

Table 4 Eighty SSR markers used to test seed purity and uniformity of wheat varieties

Locus	Marker type	Chromosome	Number of allele	PIC	Fragment size (bp)	Marker grade for uniformity assessment	Left primer (5'-3')	Right primer (5'-3')
<i>Xcwm65</i> *	EST-SSR	1A	10	0.66	220-260	1	TCATTGGTGTCCCTCGTGT	GAATAATGCCTTGACCCTGGAC
<i>Xbarc80</i> *	Genomic-SSR	1B	6	0.61	97-125	1	GCGAATTAGCATCTGCATCTGTTTGAG	CGGTCAACCAACTACTGCACAAC
<i>Xcfd72</i> *	Genomic-SSR	1D	11	0.66	210-240	1	CTCCTTGGAAATCTCACCGAA	TCCTTGGGAATATGCCTCCT
<i>Xgwm294</i> *	Genomic-SSR	2A	16	0.74	67-105	1	GGATTGGAGTTAAGAGAGAACCG	GCAGAGTGATCAATGCCAGA
<i>Xgwm429</i> *	Genomic-SSR	2B	12	0.67	190-230	1	TTGTACATTAAGTTCCCATTA	TTTAAGGACCTACATGACAC
<i>Xgwm261</i> *	Genomic-SSR	2D	11	0.67	160-210	1	CTCCCTGTACGCCTAAGGC	CTCGCGCTACTAGCCATTG
<i>Xgwm155</i> *	Genomic-SSR	3A/1D	9	0.74	120-160	1	CAATCATTCCCCCTCCC	AATCATTGGAAATCCATATGCC
<i>Xswes185</i> *	EST-SSR	3B	4	0.58	180-190	1	ACATCATCAACTATGCCGAACA	CGCCTTTAGATCCCACCC
<i>Xgdm72</i> *	Genomic-SSR	3D	10	0.71	120-150	1	TGGTTTTCTCGAGCATCAA	TGCAACGATGAAGACCAGAA
<i>Xgwm610</i> *	Genomic-SSR	4A	7	0.55	160-175	1	CTGCCTTCTCCATGGTTTGT	AATGGCCAAAGGTTATGAAGG
<i>Xksum62</i> *	EST-SSR	4B	9	0.77	170-210	1	GGAGAGGATAGGCACAGGAC	GAGAGCAGAGGGAGCTATGG
<i>Xbarc91</i> *	Genomic-SSR	2B/4D	12	0.76	110-160	1	TTCCATAACGCCGATAGTA	GCGTTTAATATTAGCTTCAAGATCAT
<i>Xgwm304</i> *	Genomic-SSR	2A/5A	16	0.80	200-230	1	AGGAAACAGAAATATCGCGG	AGGACTGTGGGGAATGAATG
<i>Xgwm67</i> *	Genomic-SSR	3A/5B/7D	8	0.58	70-100	1	ACCACACAAACAAGGTAAGCG	CAACCCTCTTAATTTTGTGGG
<i>Xcfd29</i> *	Genomic-SSR	5D	14	0.82	160-190	1	GGTTGTCAGGCAGGATATTTG	TATTGATAGATCAGGGCGCA
<i>Xgwm334</i> *	Genomic-SSR	6A	21	0.80	100-140	1	ATCTGCCTCTTCGCATCATC	CAGTGCTCTTCACTCTCCCC
<i>Xbarc198</i> *	Genomic-SSR	6A /6B	12	0.66	110-160	1	CGCTGAAAAGAAGTGCCGCATTATGA	CGCTGCCTTTTCTGGATTGCTTGCA
<i>Xcfd76</i> *	Genomic-SSR	6D	14	0.79	140-170	1	GCAATTTACACGCGACTTA	CGCTCGACAACATGACACTT
<i>Xcfa2028</i> *	Genomic-SSR	7A/7B	7	0.49	230-260	1	TGGGTATGAAAGGCTGAAGG	ATCGCGACTATTCAACGCTT
<i>Xgwm333</i> *	Genomic-SSR	7B	8	0.61	140-150	1	GCCCCGGTCATGTAAAACG	TTTCAGTTTTCGTTAAGCTTTG
<i>Xgwm437</i> *	Genomic-SSR	7D	18	0.69	90-140	1	GATCAAGACTTTTGTATCTCTC	GATGTCCAACAGTTAGCTTA
<i>Xbarc17</i> *	Genomic-SSR	1A	8	0.77	250-280	2	GCGCAACATATTCAGCTCAACA	TCCACATCTCGTCCCTCATAGTTTG
<i>Xcwm75</i>	EST-SSR	1A	4	0.50	210-240	2	TGGCAATGCAGCGATGTCT	TTGGGGTGGTTGTTGCTGATA

Locus	Marker type	Chromosome	Number of	PIC	Fragment size (bp)	Marker grade for uniformity assessment	Left primer (5'-3')	Right primer (5'-3')
<i>Xbarc240*</i>	Genomic-SSR	1A/1B/1D/5B	8	0.70	240-280	2	AGAGGACGCTGAGAACTTTAGAGAA	GCGATCTTTGTAATGCATGGTGAAC
<i>Xgwm268*</i>	Genomic-SSR	1B	19	0.82	230-250	2	AGGGGATATGTTGTCACCTCCA	TTATGTGATTGCGTACGTACCC
<i>Xcfd48</i>	Genomic-SSR	1B	5	0.79	250-380	2	ATGGTTGATGGTGGGTGTTT	ATGTATCGATGAAGGGCCAA
<i>Xcwm170</i>	EST-SSR	1D	2	0.37	230-250	2	GCAATTGCGCAGATGGAGA	CCCGTTGTTGTTGTGGAAAAG
<i>Xcwm334</i>	EST-SSR	2A	3	0.53	175-180	2	ATCTGCCCTTTCGCATCATC	CAGTGCTCTTCACTCTCCCC
<i>Xgwm425</i>	Genomic-SSR	2A	9	0.72	120-141	2	GAGCCCACAAGCTGGCA	TCGTTCTCCCAAGGCTTG
<i>Xwmc764</i>	Genomic-SSR	2B	7	0.81	130-180	2	CCTCGAACCTGAAGCTCTGA	TTCGCAAGGACTCCGTAACA
<i>Xgwm539</i>	Genomic-SSR	2D	13	0.83	130-170	2	CTGCTCTAAGATTCATGCAACC	GAGGCTTGTGCCCTCTGTAG
<i>Xksum73*</i>	EST-SSR	2D	3	0.55	160-180	2	GATCAGGCCAGGCTACTCAG	CTTCTTACAGCCCTCCTTCT
<i>Xwmc532</i>	Genomic-SSR	3A	8	0.59	160-200	2	GATACATCAAGATCGTGCCAAA	GGGAGAAATCATTACGAAGGG
<i>Xbarc324</i>	Genomic-SSR	3A	7	0.69	247-380	2	CCAATTCTGCCATAGGTGA	GAGGAAATAAGATTCAGCCAACTG
<i>Xwmc326</i>	Genomic-SSR	3B	8	0.76	170-210	2	GGAGCATCGCAGGACAGA	GGACGAGGACGCCTGAAT
<i>Xgwm161*</i>	Genomic-SSR	3D	8	0.69	150-170	2	GATCGAGTGATGGCAGATGG	TGTGAATTACTTGGACGTGG
<i>Xwmc468*</i>	Genomic-SSR	4A	12	0.84	130-170	2	AGCTGGGTTAATAACAGAGGAT	CACATAACTGTCCACTCCTTTC
<i>Xgwm495</i>	Genomic-SSR	4B	9	0.75	150-180	2	GAGAGCCTCGCGAAATATAGG	TGCTTCTGGTGTTCCTTCG
<i>Xwmc457</i>	Genomic-SSR	4D	4	0.58	160-170	2	CTCCATGAATCAAAGCAGCAC	CATCCATGGCAGAAACAATAGC
<i>Xcfa2155</i>	Genomic-SSR	5A	5	0.74	220-240	2	TTTGTTACAACCCAGGGGG	TTGTGTGGCGAAAGAAACAG
<i>Xbarc21*</i>	Genomic-SSR	5B/6D	7	0.65	200-215	2	GCGTCTTCCGGTTTTGTTTACTTTTC	GCGTTAGGGCTATGGCGGTGTG
<i>Xcwm232*</i>	EST-SSR	5B	2	0.36	160-200	2	CTACAACAACGTCAGCCTC	AGTAGCTCTTACCCCTC
<i>Xcfd8</i>	Genomic-SSR	5D	7	0.66	150-160	2	ACCACCGTCATGTCCTGAG	GTGAAGACGACAAGACGCAA
<i>Xgwm169*</i>	Genomic-SSR	6A	8	0.70	180-235	2	ACCACTGCAGAGAACACATACG	GTGCTCTGCTCTAAGTGTGGG

<i>Xgwm570</i>	Genomic-SSR	6A/6B	8	0.74	120-150	2	TCGCCTTTTACAGTCGGC	ATGGGTAGCTGAGAGCCAAA
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Continuing table 4

Locus	Marker type	Chromosome	Number of allele	PIC	Fragment size (bp)	Marker grade for uniformity assessment	Left primer (5'-3')	Right primer (5'-3')
<i>Xbarc354</i>	Genomic-SSR	6B	7	0.75	180-260	2	CGCCAGACTGCTAGGATAATACTTT	GCGGCTAGTGCTCCCTCATAAT
<i>Xgwm325</i>	Genomic-SSR	6D	8	0.76	130-150	2	TTTCTTCTGTCTGTTCTCTTCCC	TTTTTACGCGTCAACGACG
<i>Xcfd49</i>	Genomic-SSR	6D	12	0.82	160-240	2	TGAGTTCTTCTGGTGAGGCA	GAATCGGTTCAACAAGGGAAA
<i>Xwmc603</i>	Genomic-SSR	7A	10	0.74	90-120	2	ACAAACGGTGACAATGCAAGGA	CGCCTCTCTCGTAAGCCTCAAC
<i>Xwmc702</i>	Genomic-SSR	7D	8	0.80	150-190	2	GAATCACATCGAATGGATCTCA	GAGGCCTTTTTCGATATTCTGC
<i>Xksum182</i>	Genomic-SSR	1A	4	0.53	170-200	3	ATGTTGCAGCAGAGCATTTG	TGGGGTTGTTGTTGCTGATA
<i>Xcni105</i>	EST-SSR	1B	2	0.37	110-140	3	GAGATCAGCGTCGTTCCCTC	ACGTCCTTGGAGAGCATCC
<i>Xbarc174</i>	Genomic-SSR	1B	7	0.76	160-230	3	TGGCATTTTTTCTAGACCAATACAT	GCGAACTGGACCAGCCTTCTATCTGTTC
<i>Xgdm111</i>	Genomic-SSR	1D	5	0.61	280-320	3	CACTCACCCCAAACCAAAGT	GATGCAATCGGGTCGTTAGT
<i>Xbarc168</i>	Genomic-SSR	2D	4	0.56	150-180	3	GCGATGCATATGAGATAAGGAACAAATG	GCGGCTCTAAGGCGGTTTCAAAT
<i>Xwmc264</i>	Genomic-SSR	3A	11	0.82	120-150	3	CTCCATCTATTGAGCGAAGGTT	CAAGATGAAGCTCATGCAAGTG
<i>Xwmc428</i>	Genomic-SSR	3A	8	0.72	230-260	3	TTAATCCTAGCCGTCCCTTTTT	CGACCTTCGTTGGTTATTTGTG
<i>Xbarc12</i>	Genomic-SSR	3A	9	0.84	201-350	3	CGACAGAGTGATCACCCAAATATAA	CATCGGTCTAATTGTCAATGTA
<i>Xgwm566</i>	Genomic-SSR	3B	7	0.76	120-140	3	TCTGTCTACCCATGGGATTTG	CTGGCTTCGAGGTAAGCAAC
<i>Xwmc777</i>	Genomic-SSR	3B	11	0.67	100-170	3	GCCATCAAGCGGATCAACT	GTAGCGCCCTGTTTACCTC
<i>Xcfd152</i>	Genomic-SSR	3D	7	0.73	290-350	3	TGGAAGTCTGGAACCACTCC	GCAACCAGACCACACTCTCA
<i>Xgwm645</i>	Genomic-SSR	3D	12	0.89	135-170	3	TGACCGGAAAAGGCGAGA	GCCCTGCAGGAGTTTAAGT
<i>Xksum134</i>	EST-SSR	4A	2	0.36	250-280	3	ACCGCCGCTCTCCTCTCCTC	GCCATGGTGCTCCTCCTTCC
<i>Xbarc170</i>	Genomic-SSR	4AL	13	0.8	110-150	3	CGCTTGACTTTGAATGGCTGAACA	CGCCCACTTTTTACCTAATCCTTTTGAA
<i>Xbarc20</i>	Genomic-SSR	4B/7B	6	0.74	180-210	3	GCGATCCACACTTTCGCTCTTTTACA	GCGATGTCGGTTTTACGCCTTTT

<i>Xwmc349</i>	Genomic-SSR	4B	7	0.57	85-110	3	ACACACACTCGATCGCAC	GCAGTTGATCATCAAAACACA
<i>Xwmc285</i>	Genomic-SSR	4D	3	0.62	290-320	3	TGTGGTTGTATTTCGGTATGG	TTGTGGTGCTGAGTTAGCTTGT

Continuing table 4

Locus	Marker type	Chromosome	Number of allele	PIC	Fragment size (bp)	Marker grade for uniformity assessment	Left primer (5'-3')	Right primer (5'-3')
<i>Xwmc720</i>	Genomic-SSR	4D	13	0.81	100-140	3	CACCATGGTTGGCAAGAGA	CTGGTGATACTGCCGTGACA
<i>Xgwm186</i>	Genomic-SSR	5A	7	0.75	132-180	3	GCAGAGCCTGGTTCAAAAAG	CGCCTCTAGCGAGAGCTATG
<i>Xcwem44</i>	EST-SSR	5A/5B/5D	4	0.74	50-70	3	AGTGCCTGCAAACACAGAG	AGCCGTACACCTTCATAGGC
<i>Xwes26</i>	EST-SSR	5B	2	0.38	160-175	3	TCCCGAGAAGAAGCGAGAT	CCCCAGCAGCAGCACCGTCAC
<i>Xgwm617</i>	Genomic-SSR	5A/6A	11	0.76	100-180	3	GATCTTGGCGCTGAGAGAGA	CTCCGATGGATTACTCGCAC
<i>Xwmc1</i>	Genomic-SSR	3B/6A	5	0.47	130-160	3	ACTGGGTGTTTGCTCGTTGA	CAATGCTTAAGCGCTCTGTG
<i>Xgwm459</i>	Genomic-SSR	6A	13	0.82	118-126	3	ATGGAGTGGTCACACTTTGAA	AGCTTCTCTGACCAACTTCTCG
<i>Xbarc196</i>	Genomic-SSR	6D	3	0.42	130-217	3	GGTGGGTTTTATCGAATAGATTGCT	GCGTTTCGTCAAGATTAATGCAGGTTT
<i>Xcfd33</i>	Genomic-SSR	6D	3	0.51	170-242	3	TACCGCAATAATCACACCCA	GGTCGATGGACTGTCCCTAA
<i>Xgwm469</i>	Genomic-SSR	6D	9	0.8	150-180	3	CAACTCAGTGCTCACACAACG	CGATAACCACTCATCCACACC
<i>Xswes209</i>	EST-SSR	7B	4	0.63	280-300	3	AAGTCCACATTTCAACCCTG	GTTTCACCTCTAGCCTACCC
<i>Xgwm344</i>	Genomic-SSR	7B	8	0.61	130-150	3	CAAGGAAATAGGCGGTAAC	ATTTGAGTCTGAAGTTTGCA
<i>Xgwm44</i>	Genomic-SSR	7D	12	0.84	160-210	3	GTTGAGCTTTTCAGTTCGGC	ACTGGCATCCACTGAGCTG

*: The markers for detection of seed purity