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*****
1Ax2* TTTGGGGAATACCTGCACTACTAAGAAGGTATTACCTAAGTGTAACTTCTCCGCAACAGGTTTCATACTATCCAGGCCAAGCTT
1Anull TTTGGGGAATACCTGCACTACTAAGAAGGTATTACCTAAGTGTAACTTCTCCGCAACAGGTTTCATACTATCCAGGCCAAGCTT
1Ax1 TTTGGGGAATACCTGCACTACTAAGAAGGTATTACCTAAGTGTAACTTCTCCGCAACAGGTTTCATACTATCCAGGCCAAGCTT
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1Bx7 TTTGGGGAATACCTGCACTACTAAGAAGGTATTACCCAAGTGTAACTTCTTCGCAGCAGGGGTCATACTATCCAGGCCAAGCTT
1Bx17 TTTGGGGAATACCTGCACTACTAAGAAGGTATTACCCAAGTGTAACTTCTTCGCAGCAGGGGTCATACTATCCAGGCCAAGCTT
1Bx14 TTTGGGGAATACCTGCACTACTAAGAAGGTATTACCCAAGTGTAACTTCTTCGCAGCAGGGGTCATACTATCCAGGCCAAGCTT
1Bx20 TTTGGGGAATACCTGCACTACTAAGAAGGTATTACCCAAGTGTAACTTCTTCGCAGCAGGGGTCATACTATCCAGGCCAAGCTT
asX TTTGGGGAATACCTGCACTACTAAGAAGGTATTACCCAAGTGTAACTTCTTCGCAGCAGGGGTCATACTATCCAGGCCAAGCTT
1Dx2 TTTGGGGAATACCTGCACTACTAAGAAGGTATTACCCAAGTGTAACTTCTCCGCAACAGGTTTCATACTATCCAGGCCAAGCTT
1Dx2.2 TTTGGGGAATACCTGCACTACTAAGAAGGTATTACCCAAGTGTAACTTCTCCGCAACAGGTTTCATACTATCCAGGCCAAGCTT
1Dx5 TTTGGGGAATACCTGCACTACTAAGAAGGTATTACCCAAGTGTAACTTCTCCGCAACAGGTTTCATACTATCCAGGCCAAGCTT
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1By8 GC AAC AAGGGTACTATCCAAC TTCTCCACAGCAGCTAGGAC AAGGGCAACAA CAGGCAATGCGAACAA TCAGGCAAGGGCAAC AAGGGTACTACCC
1By18 GC AAC AAGGGTACTATCCAAC TTCTCCACAGCAGCTAGGAC AAGGGCAACAA CAGGCAATGCGAACAA TCAGGCAAGGGCAAC AAGGGTACTACCC
1By9 GC AAC AAGGGTACTATCCAAC TTCTCCACAGCAGCTAGGAC AAGGGCAACAA CAGGCAATGCGAACAA TCAGGCAAGGGCAAC AAGGGTACTACCC
1By22 GC AAC AAGGGTACTATCCAAC TTCTCCACAGCAGCTAGGAC AAGGGCAACAA CAGGCAATGCGAACAA TCAGGCAAGGGCAAC AAGGGTACTACCC
1By15 GC AAC AAGGGTACTATCCAAC TTCTCCACAGCAGCTAGGAC AAGGGCAACAA CAGGCAATGCGAACAA TCAGGCAAGGGCAAC AAGGGTACTACCC
1By16 GC AAC AAGGGTACTATCCAAC TTCTCCACAGCAGCTAGGAC AAGGGCAACAA CAGGCAATGCGAACAA TCAGGCAAGGGCAAC AAGGGTACTACCC
asY GC AAC AAGGGTACTATCCAAC TTCTCCACAGCAGCTAGGAC AAGGGCAACAA CAGGCAATGCGAACAA TCAGGCAAGGGCAAC AAGGGTACTACCC
1Dy10 GC AAC AAGGGTACTATCCAAC TTCTCCACAGCAGCTAGGAC AAGGGCAACAA CAGGCAATGCGAACAA TCAGGCAAGGGCAAC AAGGGTACTACCC
1Dy10.1 GC AAC AAGGGTACTATCCAAC TTCTCCACAGCAGCTAGGAC AAGGGCAACAA CAGGCAATGCGAACAA TCAGGCAAGGGCAAC AAGGGTACTACCC
1Dy12 GC AAC AAGGGTACTATCCAAC TTCTCCACAGCAGCTAGGAC AAGGGCAACAA CAGGCAATGCGAACAA TCAGGCAAGGGCAAC AAGGGTACTACCC

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**Additional file 2:Nucleotide sequence alignment of the *asX* or the *asY* with their corresponding elements in other x-type (upper region) or y-type (lower region) *HMW-GS* genes expressed in the wheat variety, respectively; *asX* and *asY* represent sequences highly homologous to most of all x-type or y-type *HMW-GS* genes, respectively. Nucleotides conserved in all sequences are represented by ‘\*’.**

The alignment was conducted using the Clustal W program.