Appendix A Sampling position from apple tree. The shoot tip as indicated by red circles, including apex with 2-3 expanding leaflets L1-L3. The mature leaves (counted from the shoot tips) are in positions L4-L7, respectively.

Appendix B Primers used in this study

Name/Accession no	Sequence (5'-3')	Purpose
qMdA6PR	F: GCGCGACTCTCTCGTCAAA	Quantitative expression
	R:CCAAAGGTGAAACAGAACCAAAC	of *MdA6PR*
qMdSDH1	F:CTGTACCAGAGGCACCTCCGAGT	Quantitative expression
	R:TTGCATGCTCTGCTCTCTCGTTG	of *MdSDH1*
qMdSDH2	F:ACACCATCAAGATCCTACCTTTC	Quantitative expression
	R:CATTTCATGGTCTTGAGGTAGTG	of *MdSDH2*
qMdNINV1	F:CTGTACCAGAGGCACCTCCGAGT	Quantitative expression
	R:TTGCATGCTCTGCTCTCTCGTTG	of *MdNINV1*
qMdNINV2	F:CTGTACCAGAGGCACCTCCGAGT	Quantitative expression
	R:TTGCATGCTCTGCTCTCTCGTTG	of *MdNINV2*
qMdCWIN1	F:TAACAAATATGTGGTGCTCCTCTG	Quantitative expression
	R:ACCCTAGCTGTTATGCACGCT	of *MdCWIN1*
qMdCWIN2	F:TTCAAAGCTAAAGGCAGACACG	Quantitative expression
	R:GTAAATCTACATCTACAAAGCCAGC	of *MdCWIN2*
qMdSUSY1	F:CTCAAGCGTGTTAAGCAACAG	Quantitative expression
	R: CTGAATGGAACACGAAGAATATC	of *MdSUSY1*
qMdSUSY2	F:TGTGGTTGGTGGTTACATGGATG	Quantitative expression
	R:GCTGCTATCCATCGGAACTGAC	of *MdSUSY2*
qMdSUSY3	F:TTATGGTTTCTGGAAGTATGTGTC	Quantitative expression
	R:GTCGATGGCTTCAGGAACAGATT	of *MdSUSY3*
qMdSUSY4	F:CTGTACCAGAGGCACCTCCGAGT	Quantitative expression
	R:TTGCATGCTCTGCTCTCTCGTTG	of *MdSUSY4*
qMdFRK1	F:CTGTACCAGAGGCACCTCCGAGT	Quantitative expression
	R:TTGCATGCTCTGCTCTCTCGTTG	of *MdFRK1*
qMdFRK2	F:CTGTACCAGAGGCACCTCCGAGT	Quantitative expression
	R:TTGCATGCTCTGCTCTCTCGTTG	of *MdFRK2*
qMdFRK3	F:AGAGTCAAGGGTATGAAGGTAGATG	Quantitative expression

	R:CTCGTCCTGAAGCAAAGAAAGAT	of *MdFRK3*
qMdFRK4	F:TCAGGATGAGGAGGGGCTACGAG	Quantitative expression
	R:CTGCTTTAAGCACTGGAGCACAGC	of *MdFRK4*
qMdHxK1	F: CTGAAAGTGGTCGGGAGCAAAC	Quantitative expression
	R: TGCACGAGTGGCAACTATGTCG	of *MdHxK1*
qMdHxK2	F:TGGTGGATTATACGAGCATTACA	Quantitative expression
	R:TCCAGGGTATTGTGAGTGAGAG	of *MdHxK2*
qMdHxK3	F:AGATTGTGGCGGATGTATGTGAC	Quantitative expression
	R:CAACAGTCCTCTTGCCAAAAATG	of *MdHxK3*
qMdHxK4	F:GTGGGGCAGAGTGTTTGGTGTT	Quantitative expression
	R:AACCACCGTCAGAGGCCAAACC	of *MdHxK4*
qMdSPS1	F:AGTGTAGTACTCAAGGGAGTTGG	Quantitative expression
	R:TGCTCATGGGGAAGGCTTTAC	of *MdSPS1*
qMdSPS6	F:AGGTTCTGTTGAGTATGGCAGTGAG	Quantitative expression
	R:GTGCTTCAAGTGCCGCTGAGA	of *MdSPS6*
	F:GGACAGCGAGGACATTCAGC	Real-time PCR of actin
MdActin	R:CTGACCCATTCCAACCATAACA	as a reference gene in
		apple plants