

Validated methods for unauthorized GMO

試験法

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Crop plant	method	gene description	inserted gene	detection of	Forward primer	Reverse primer	Probe	amplicon (bp)
Rice	qualitative Real-time PCR	endogenous gene	(phospholipase D)	PLD2	5'-GCTTAGGGAACAGGGAAGTAAAGTT-3'	5'-CTTAGCATAGTCTGTGCCATCCA-3'	5'-FAM-TGAGTATGAACCTGCAGGTGCG-TAMRA-3'	80
	qualitative Real-time PCR	insect-resistant	cry1Ac	Bi63	5'-GCAGGAGTATTATCGACGATTC-3'	5'-AAGACCGCAACAGGATTC-3'	5'-FAM-AATAAGTCGAGGTACCAGCTCGAATTTCC-TAMRA-3'	147
	qualitative Real-time PCR	insect-resistant	cry1Ab/Ac	NNBt	5'-GCAGGAGTATTATCGACGATTC-3'	5'-AAGACCGCAACAGGATTC-3'	5'-FAM-AATGAGAATTCGGTACCCCGCCTGCA-TAMRA-3'	147
	qualitative Real-time PCR	insect-resistant	cowpea trypsin inhibitor	CpTI2	5'-TGCAAGTCCAGGATGAAGAT-3'	5'-ACCGCAACAGGATTCATC-3'	5'-FAM-ATGAAAGATGAACCTCTAG-MGB-3'	121
Rice	qualitative Real-time PCR	endogenous gene	(phospholipase D)	PLD	5'-TGGTAGCGTTTTGAGTCT-3'	5'-CTGATCCACTAGCAGGAGTCC-3'	5'-VIC-TGTTGTGTCGCAATGTGGCCTG-TAMRA-3'	68
	qualitative Real-time PCR	herbicide-tolerant	phosphinothricin N-acetyltransferase (S. hygroscopicus)	LL601	5'-TATCCTTCGCAAGACCTTC-3'	5'-ATGTGGCGGGGCTGTCTGTG-3'	5'-FAM-TCTATATAAGGAATTCATTCATT-MGB-3'	136

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wheat	qualitative Real-time PCR	endogenous gene	(proline-rich protein)	PRP	5'-GCACCCATGATGACTACTACTTCTGTA-3'	5'-TGCAACGAATAAAGCATGTG-3'	5'-FAM-CTGTGCACATGACTCAGTTGTCTTCTGTG-TAMRA-3'	117
	qualitative Real-time PCR	endogenous gene	(acetyl-CoA carboxylase 1)	acc1	5'-GCC TAC CCC CTT CAA CAA GAT GA-3'	5'-GTA CGC GCT TGA ACC CTT TTT TTG-3'	5'-FAM-CCA CCG ACG AGT TAA AAC CAA AGA TAC ACG-TAMRA-3'	92
	qualitative Real-time PCR (event-specific)	herbicide-tolerant	cp4epsps	MON71800	5'-TTCTTCTCTCTTGAATCTCAATACAA-3'	5'-CCCCATTTGGACGTGAA-3'	5'-FAM-TCCCCCTCTCTAATC-MGB-3'	95
	qualitative Real-time PCR (event-specific)	herbicide-tolerant	cp4epsps	MON71700	5'-CCATCATACTACTGTGCTCATGT-3'	5'-CGGATGCGCAACTAGT-3'	5'-FAM-TTCCCGGACGCGGGCGG-TAMRA-3'	69
	qualitative Real-time PCR (event-specific)	herbicide-tolerant	cp4epsps	MON71200	5'-CAGCAGCTCATCGAGC-3'	5'-CCG TTC GTC ATT GAC TGT T-3'	5'-HEX-CAT ACG GAAZVENAAG ATG CTG CAG GGAATA TAT TGA AC-IABKFO-3'	139
	qualitative Real-time PCR (Construct-specific)	herbicide-tolerant	cp5epsps	MON71100/71300	5'-GCG CGG TGT CAT TGT TAC TAG-3'	5'-TGA CCT CGA GTA AGC TTG TTA ACG-3'	5'-FAM-ACC AAG CTT GAT ATC C-MGB-3'	103

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Flax	qualitative Real-time PCR	endogenous gene	(stearyl-acyl carrier protein desaturase 2)	SAD	5'-GCTCAACCAGTCCACACT-3'	5'-TGGAGGAGATCTGGAGGAG-3'	5'-FAM-TGTTGAGGAGGTGTTGAAGGA-BHQ1-3'	68
	qualitative Real-time PCR	herbicide-tolerant	mutant acetolactate synthase	FP967	5'-AGOGGCGAACTAGGATAAA-3'	5'-ACCTTCGGCTGCTGCTA-3'	5'-FAM-CGCGGGGCTGCTATG-BHQ1-3'	105

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Papaya	qualitative Real-time PCR	endogenous gene	(chymopapain)	CHY	5'-CCATGCGATCCTCCA-3'	5'-CATCGTAGCCATTGTAACACTAGCTAA-3'	5'-FAM-TTCCCTTCATCCATCCCACTCTTGAGA-TAMRA-3'	73
	qualitative Real-time PCR	promoter	Cauliflower mosaic virus 35S promoter	CaM	5'-GCTCTCGCGCAGTGTG-3'	5'-AAGAGCTGGTTGGAACGCTTC-3'	5'-FAM-CAAGATGGACCCGCCACCG-TAMRA-3'	82
	qualitative Real-time PCR	virus-resistance	Papaya RingSpot Virus coat protein from Taiwan strain	PRSV-YK	5'-ACACGGGGACTCTAGAG-3'	5'-ACCGGATCCACAGCTTC-3'	5'-FAM-TCCCTTCATGGGCT-TAMRA-3'	76
	qualitative Real-time PCR	virus-resistance	Papaya RingSpot Virus coat protein from Thailand strain	PRSV-SC	5'-CATTTTCATTTGGAGAACACG-3'	5'-ACCAGCATCCACAGCTTC-3'	5'-FAM-ACTCTAGAGATCCATGCTCCAA-TAMRA-3'	70
	qualitative Real-time PCR	virus-resistance	Papaya RingSpot Virus coat protein from Chinese strain	PRSV-HN	5'-GACGAGTACAGGAGACGCC-3'	5'-GTTGCTCACTGAAGCGGGAAG-3'	5'-FAM-TGSGTCTATTGGGCGAATCACTAC-BHQ1-3'	174

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Maize	conventional PCR	endogenous gene	(zein)	Zein	5'-CCTATAGCTTCCCTTCTCC-3'	5'-TGCTGTAATAGGCTGATGA-3'		157
	conventional PCR	insect-resistant	cry1Ab, cp4epsps	Bt10	5'-CACACAGGAGATTATATAGGGTACTCA-3'	5'-ACACGGAAATGTTGAATCACTACTCT-3'		117
	conventional PCR	insect-resistant	cry1Ab, cp4epsps (for confirmation)	Bt10	5'-GCCAACACCCCTCAACCTCA-3'	5'-GAAGCTGTTGCTCTGAAGAATC-3'		151
	conventional PCR	insect-resistant	pat, cry9c	CBH351	5'-CCTTCGCAAGACCTTCTCTATA-3'	5'-GTAGCTGCGGTGTAGTCCCTGT-3'		170
	conventional PCR	insect-resistant	pat, cry9c (for confirmation)	CBH351	5'-TACTACATCGACCGCATGGA-3'	5'-CCTAATCCCTTATCTGGGA-3'		171
	qualitative Real-time PCR	endogenous gene	(starch synthase IIb)	SSIIb	5'-CCAATCCTTTGACATGCTCC-3'	5'-GATCAGTTTGGTCCGGA-3'	5'-FAM-AGCAAAAAAGAGCCCTGCAA-TAMRA-3'	114
	qualitative Real-time PCR (event-specific)	insect-resistant	pat, cry34Ab1, cry35Ab1	DAS59132	5'-CCGCAATGTGTATTAAAGTTGTCTAAG-3'	5'-GGTGAATGTGCGGTGTGT-3'	5'-FAM-CAATTTTACACCAGAGCCGACACG-TAMRA-3'	79

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Rapeseed	qualitative Real-time PCR	endogenous gene	(Brasica rapa acetyl CoA carboxylase)	ACCg8	5'-GGTTATACGCGCTTGTGGTGG-3'	5'-AACATCAGGCTGTCCAAGAAAGAT-3'	5'-VIC-CTATGTTGAGGAATTATA-MGB-3'	78
	qualitative Real-time PCR	endogenous gene	(Brasica napus cruciferin)	BnC1	5'-GAAGCTCTCCTTGGTGGTAAA-3'	5'-TCACGAATTTGAATCTCGATACTCA-3'	5'-FAM-ACGTGAATCTGATTTTGA-MGB-3'	75
	qualitative Real-time PCR	endogenous gene	(AcyI-ACP thioesterase)	FatA	5'-GGTCTCTCAGCAAGTGGGTGAT-3'	5'-TGTCGCCGAACCTCATCTGAA-3'	5'-VIC-ATGACCAACGACACAAAGGGCTTCA-TAMRA-3'	76
	qualitative Real-time PCR	herbicide-tolerant	cp4epsps, gox	RTT3 (cp4epsps, gox)	5'-CCATATTGACCATCATCACTATTGCT-3'	5'-GCTTATACGAAGCAAGAAAGGA-3'	5'-FAM-TTCCCGGACATGAAGATCATCTCCTT-TAMRA-3'	108

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Potato	qualitative Real-time PCR	endogenous gene	(Adenine Phosphoribosyl Transferase)	APRT	5'-TGAAACGATCCCGATCG-3'	5'-CAATCCGACGGATACGCTC-3'	5'-FAM-TGGCGCTCATGATCCG-TAMRA-3'	90
	qualitative Real-time PCR			F10	5'-GAAGCTATAAACAATACTGGTCC-3'	5'-CACACACTCGTTTACAC-3'	5'-FAM-TATATATCTCTGGACAGTTG-TAMRA-3'	76
	qualitative Real-time PCR	Low Acrylamide Potential and Reduced Black Spot Bruise	partial Asn1, partial R1, partial PhL, partial Ppo5	J3	5'-ATCAAACCGGTACTCAAATTT-3'	5'-GAGTTGCAAAATGTGAATTTTTC-3'	5'-FAM-CAACAGGACACAAACCAAGTAGGAACTCAC-TAMRA-3'	87
	qualitative Real-time PCR			Y9	5'-CCTTCTTCCGATCCTCAAC-3'	5'-GTTCAATTTTAAATGTTGACTATG-3'	5'-FAM-CCAGTCCAGGAAAGTCC-TAMRA-3'	81
	qualitative Real-time PCR			X17	5'-TAGCAAAATGAGTTGTGAG-3'	5'-GATTTGGATCAACACAC-3'	5'-FAM-CGCTCAGGATATATACGGGT-TAMRA-3'	77

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Animal	method	gene description	inserted gene	detection of	Forward primer	Reverse primer	Probe	amplicon (bp)
Salmon (Atlantic salmon)	qualitative Real-time PCR	endogenous gene	(nuclear ribosome RNA18S subunit)	18S	5'-TGTGCGCTAGAGGTGAAAT-3'	5'-GCAATGCTTTGCTTCC-3'	5'-FAM-TGGACCGGCGAAGCGG-TAMRA-3'	61
	qualitative Real-time PCR	endogenous gene		Growth hormone 1	5'-AAGGTGCAAAACATGTTGCCCTCT-3'	5'-ATGTAGTGTCTAGGTCACTAGAC-3'	5'-FAM-TGCGTTCTGTGCTCTATTGCAAAGTA-TAMRA-3'	176
	qualitative Real-time PCR (event-specific)	growth promoton	opAFP-GHc2 (Chinook salmon's growth hormone)	AquAd	5'-TGCTGATGCCTGTGATCCAC-3'	5'-ATGCCCTAGTGAAGTTCAGT-3'	5'-FAM-CAGTATGACCAAGTGGCAGTGTATGAGAAT-BHQ1-3'	156