

A

Vps13_ARS607_wt	CACTACATTTCGCTAAATTACATTATATTATTTTCGAGCTTTGTCT
Vps13_ARS607_3' mut	CACTACATTTCGCTAAATTACATTATATTATTTTCGAGCTTTGTCT
Vps13_ARS607_10	CACTACATTTCGCTAAATTACATTATATTATTTTCGAGCTTTGTCT
Vps13_ARS607_30	CACTACATTTCGCTAAATTACATTATATTATTTTCGAGCTTTGTCT
Vps13_ARS607_60	CACTACATTTCGCTAAATTACATTATATTATTTTCGAGCTTTGTCT
Vps13_ARS607_90	CACTACATTTCGCTAAATTACATTATATTATTTTCGAGCTTTGTCT
Vps13_ARS607_120	CACTACATTTCGCTAAATTACATTATATTATTTTCGAGCTTTGTCT
Vps13_ARS607_150	CACTACATTTCGCTAAATTACATTATATTATTTTCGAGCTTTGTCT
Vps13_ARS607_240	CACTACATTTCGCTAAATTACATTATATTATTTTCGAGCTTTGTCT
Vps13_ARS607_300	CACTACATTTCGCTAAATTACATTATATTATTTTCGAGCTTTGTCT
Vps13_ARS607_-10 (1)	CACTACATTTCGCTAAATTACATTATATTATTTTCGAGCTTTGTCT
Vps13_ARS607_-10 (2)	CACTACATTTCGCTAAATTACATTATATTATTTTCGAGCTTTGTCT
Vps13_ARS607_+5	CACTACATTTCGCTAAATTACATTATATTATTTTCGAGCTTTGTCT
Vps13_ARS607_+10	CACTACATTTCGCTAAATTACATTATATTATTTTCGAGCTTTGTCT
Vps13_ARS607_+15	CACTACATTTCGCTAAATTACATTATATTATTTTCGAGCTTTGTCT
Vps13_ARS607_ACS_mut	CACTACATTTCGCTAAATTACATTATATTATTTTCGAGCTTTGTCT

Vps13_ARS607_wt	TGTTTATATTTAGTTAC-----GTTGGGATCAAGTTTTTAAAA-----
Vps13_ARS607_3' mut	TGTTTATATTTAGTTAC-----GTTGGGATCAAGTTTTTAAAA-----
Vps13_ARS607_10	TGTTTATATTTAGTTACGTAAATAAGCTTGTTGGGATCAAGTTTTTAAAA-----
Vps13_ARS607_30	TGTTTATATTTAGTTAC-----GTTGGGATCAAGTTTTTAAAAGTAAATAAGCT
Vps13_ARS607_60	TGTTTATATTTAGTTAC-----GTTGGGATCAAGTTTTTAAAA-----
Vps13_ARS607_90	TGTTTATATTTAGTTAC-----GTTGGGATCAAGTTTTTAAAA-----
Vps13_ARS607_120	TGTTTATATTTAGTTAC-----GTTGGGATCAAGTTTTTAAAA-----
Vps13_ARS607_150	TGTTTATATTTAGTTAC-----GTTGGGATCAAGTTTTTAAAA-----
Vps13_ARS607_240	TGTTTATATTTAGTTAC-----GTTGGGATCAAGTTTTTAAAA-----
Vps13_ARS607_300	TGTTTATATTTAGTTAC-----GTTGGGATCAAGTTTTTAAAA-----
Vps13_ARS607_-10 (1)	TGTTTATATTTAGTTAC-----GTTGGGATCAAGTTTTTAAAA-----
Vps13_ARS607_-10 (2)	TGTTTATATTTAGTTAC-----GTTGGGATCAAGTTTTTAAAA-----
Vps13_ARS607_+5	TGTTTATATTTAGTTAC-----GTTGGGATCAAGTTTTTAAAA-----
Vps13_ARS607_+10	TGTTTATATTTAGTTAC-----GTTGGGATCAAGTTTTTAAAA-----
Vps13_ARS607_+15	TGTTTATATTTAGTTAC-----GTTGGGATCAAGTTTTTAAAA-----
Vps13_ARS607_ACS_mut	TGTTTATATCCAGTTAC-----GTTGGGATCAAGTTTTTAAAA-----
ARS607_ACS sequence	GTTTTATATTTA
	*****.*****
Vps13_ARS607_wt	-AACTAGATCTGGAGTGACCAAAAAAAAAAAT-----ACCCA-----
Vps13_ARS607_3' mut	-AACTAGATCTGGAGTGACCAAAAAAAAAAAT-----ACCCA-----
Vps13_ARS607_10	-AACTAGATCTGGAGTGACCAAAAAAAAAAAT-----ACCCA-----
Vps13_ARS607_30	TAACCTAGATCTGGAGTGACCAAAAAAAAAAAT-----ACCCA-----
Vps13_ARS607_60	-AACTAGATCTGGAGTGACCAAAAAAAAAAATGTAAATAAGCTTACCCA-----
Vps13_ARS607_90	-AACTAGATCTGGAGTGACCAAAAAAAAAAAT-----ACCCA-----
Vps13_ARS607_120	-AACTAGATCTGGAGTGACCAAAAAAAAAAAT-----ACCCA-----
Vps13_ARS607_150	-AACTAGATCTGGAGTGACCAAAAAAAAAAAT-----ACCCA-----
Vps13_ARS607_240	-AACTAGATCTGGAGTGACCAAAAAAAAAAAT-----ACCCA-----
Vps13_ARS607_300	-AACTAGATCTGGAGTGACCAAAAAAAAAAAT-----ACCCA-----
Vps13_ARS607_-10 (1)	-AACTAGAT-----CAAAAAAAAAAAT-----ACCCA-----
Vps13_ARS607_-10 (2)	-AACTAGATCTGGAGTGACCAAAAAAAAAAAT-----ACCCA-----
Vps13_ARS607_+5	-AACTAGATCTGGAGTGACCAAAAAAAAAAAT-----ACCCAAGCTT-----
Vps13_ARS607_+10	-AACTAGATCTGGAGTGACCAAAAAAAAAAAT-----ACCCAAGCTTACTAG-----
Vps13_ARS607_+15	-AACTAGATCTGGAGTGACCAAAAAAAAAAAT-----ACCCAAGCTTACTAGAC-----
Vps13_ARS607_ACS_mut	-AACTAGATCTGGAGTGACCAAAAAAAAAAAT-----ACCCA-----

Vps13_ARS607_wt	CGACACAATAGTTGTTTTTGTGTTCGTACCGAAGA-----AAAAGCCTTGTGCA
Vps13_ARS607_3' mut	CGACACAATAGTTGTTTTTGTGTTCGTACCGAAGA-----AAAAGCCTTGTGCA
Vps13_ARS607_10	CGACACAATAGTTGTTTTTGTGTTCGTACCGAAGA-----AAAAGCCTTGTGCA
Vps13_ARS607_30	CGACACAATAGTTGTTTTTGTGTTCGTACCGAAGA-----AAAAGCCTTGTGCA
Vps13_ARS607_60	CGACACAATAGTTGTTTTTGTGTTCGTACCGAAGA-----AAAAGCCTTGTGCA
Vps13_ARS607_90	CGACACAATAGTTGTTTTTGTGTTCGTACCGAAGA-----AAAAGCCTTGTGCA
Vps13_ARS607_120	CGACACAATAGTTGTTTTTGTGTTCGTACCGAAGA-----AAAAGCCTTGTGCA
Vps13_ARS607_150	CGACACAATAGTTGTTTTTGTGTTCGTACCGAAGA-----AAAAGCCTTGTGCA
Vps13_ARS607_240	CGACACAATAGTTGTTTTTGTGTTCGTACCGAAGAGTAAATAAGCTTAAAAGCCTTGTGCA
Vps13_ARS607_300	CGACACAATAGTTGTTTTTGTGTTCGTACCGAAGA-----AAAAGCCTTGTGCA
Vps13_ARS607_-10 (1)	CGACACAATAGTTGTTTTTGTGTTCGTACCGAAGA-----AAAAGCCTTGTGCA
Vps13_ARS607_-10 (2)	CGACACAATAGTTGTTTTTGTGTTCGTACCGAAGA-----AAAAGCCTTGTGCA
Vps13_ARS607_+5	CGACACAATAGTTGTTTTTGTGTTCGTACCGAAGA-----AAAAGCCTTGTGCA
Vps13_ARS607_+10	CGACACAATAGTTGTTTTTGTGTTCGTACCGAAGA-----AAAAGCCTTGTGCA
Vps13_ARS607_+15	CGACACAATAGTTGTTTTTGTGTTCGTACCGAAGA-----AAAAGCCTTGTGCA
Vps13_ARS607_ACS_mut	CGACACAATAGTTGTTTTTGTGTTCGTACCGAAGA-----AAAAGCCTTGTGCA

Vps13_ARS607_wt	GAAAGCAAAAATAGTACACTTCTAGCCTTGATTACCAAGAGTTATG-----AC
Vps13_ARS607_3' mut	GAAAGCAAAAATAGTACACTTCTAGCCTTGATTACCAAGAGTTATG-----AC
Vps13_ARS607_10	GAAAGCAAAAATAGTACACTTCTAGCCTTGATTACCAAGAGTTATG-----AC
Vps13_ARS607_30	GAAAGCAAAAATAGTACACTTCTAGCCTTGATTACCAAGAGTTATG-----AC
Vps13_ARS607_60	GAAAGCAAAAATAGTACACTTCTAGCCTTGATTACCAAGAGTTATG-----AC
Vps13_ARS607_90	GAAAGCAAAAATAGTACACTTCTAGCCTTGATTACCAAGAGTTATG-----AC
Vps13_ARS607_120	GAAAGCAAAAATAGTACACTTCTAGCCTTGATTACCAAGAGTTATG-----AC
Vps13_ARS607_150	GAAAGCAAAAATAGTACACTTCTAGCCTTGATTACCAAGAGTTATG-----AC
Vps13_ARS607_240	GAAAGCAAAAATAGTACACTTCTAGCCTTGATTACCAAGAGTTATG-----AC
Vps13_ARS607_300	GAAAGCAAAAATAGTACACTTCTAGCCTTGATTACCAAGAGTTATGAGTAAATAAGCTTAC
Vps13_ARS607_-10 (1)	GAAAGCAAAAATAGTACACTTCTAGCCTTGATTACCAAGAGTTATG-----AC
Vps13_ARS607_-10 (2)	GAAAGCAAAAATAGTACACTTCTAGCCTTGATTACCAAGAGTTATG-----AC
Vps13_ARS607_+5	GAAAGCAAAAATAGTACACTTCTAGCCTTGATTACCAAGAGTTATG-----AC
Vps13_ARS607_+10	GAAAGCAAAAATAGTACACTTCTAGCCTTGATTACCAAGAGTTATG-----AC
Vps13_ARS607_+15	GAAAGCAAAAATAGTACACTTCTAGCCTTGATTACCAAGAGTTATG-----AC
Vps13_ARS607_ACS_mut	GAAAGCAAAAATAGTACACTTCTAGCCTTGATTACCAAGAGTTATG-----AC

Vps13_ARS607_wt	AAAAATTTGCAGTTCAGAGTATACCTTAAAAACT
Vps13_ARS607_3' mut	AAAAATTTGCAGTTCAGAGTATACCTTAAAAACT
Vps13_ARS607_10	AAAAATTTGCAGTTCAGAGTATACCTTAAAAACT
Vps13_ARS607_30	AAAAATTTGCAGTTCAGAGTATACCTTAAAAACT
Vps13_ARS607_60	AAAAATTTGCAGTTCAGAGTATACCTTAAAAACT
Vps13_ARS607_90	AAAAATTTGCAGTTCAGAGTATACCTTAAAAACT
Vps13_ARS607_120	AAAAATTTGCAGTTCAGAGTATACCTTAAAAACT
Vps13_ARS607_150	AAAAATTTGCAGTTCAGAGTATACCTTAAAAACT
Vps13_ARS607_240	AAAAATTTGCAGTTCAGAGTATACCTTAAAAACT
Vps13_ARS607_300	AAAAATTTGCAGTTCAGAGTATACCTTAAAAACT
Vps13_ARS607_-10 (1)	AAAAATTTGCAGTTCAGAGTATACCTTAAAAACT
Vps13_ARS607_-10 (2)	AAAAATTTGCAGTTCAGAGTATACCTTAAAAACT
Vps13_ARS607_+5	AAAAATTTGCAGTTCAGAGTATACCTTAAAAACT
Vps13_ARS607_+10	AAAAATTTGCAGTTCAGAGTATACCTTAAAAACT
Vps13_ARS607_+15	AAAAATTTGCAGTTCAGAGTATACCTTAAAAACT
Vps13_ARS607_ACS_mut	AAAAATTTGCAGTTCAGAGTATACCTTAAAAACT

B

VPS13_ARS305_3' rev	GATTGTATA
VPS13_ARS305_3' rev	GATTGTATA
VPS13_ARS305_5' rev	GATTGTATA
VPS13_ARS305_5',3' rev	GATTGTATA
VPS13_ARS305_5' mut	GATTGTATA
VPS13_ARS305_ACS mut	GATTGTATA

VPS13_ARS305 wt	TCGATATATCAGAAACATACATATGATTTTTATCTTGTGAATATTCATCAAACCTCCGTTT
VPS13_ARS305_3' rev	TCGATATATCAGAAACATACATATGATTTTTATCTTGTGAATATTCATCAAACCTCCGTTT
VPS13_ARS305_5' rev	TCGATATATCAGAAACATACATATGATTTTTATCTTGTGAATATTCATCAAACCTCCGTTT
VPS13_ARS305_5',3' rev	TCGATATATCAGAAACATACATATGATTTTTATCTTGTGAATATTCATCAAACCTCCGTTT
VPS13_ARS305_5' mut	TCGATATATCAGAAACATACATATGATTTTTATCTTGTGAATATTCATCAAACCTCCGTTT
VPS13_ARS305_ACS mut	TCGATATATCAGAAACATACATATGATTTTTATCTTGTGAATATTCATCAAACCTCCGTTT

VPS13_ARS305 wt	TTAGCCCCCGTGTAAAGTTACTTTAATGAGTATTTGATCCTTTTTTTTTATTGTGTTGGTTT
VPS13_ARS305_3' rev	TTAGCCCCCGTGTAAAGTTACTTTAATGAGTATTTGATCCTTTTTTTTTATTGTGTTGGTTT
VPS13_ARS305_5' rev	TTAGCCCCCGTGTAAAGTTACTTTAATGAGTATTTGATCCTTTTTTTTTATTGTGTTGGTTT
VPS13_ARS305_5',3' rev	TTAGCCCCCGTGTAAAGTTACTTTAATGAGTATTTGATCCTTTTTTTTTATTGTGTTGGTTT
VPS13_ARS305_5' mut	TTAGCCCCCGTGTAAAGTTACTTTAATGAGTATTTGATCCTTTTTTTTTATTGTGTTGGTTT
VPS13_ARS305_ACS mut	TTAGCCCCCGTGTAAAGTTACTTTAATGAGTATTTGATCCTTTTTTTTTATTGTGTTGGTTT

VPS13_ARS305 wt	TTATATGTTTTGTTATGTAT TGTTTAT TTTCCCTTTAATTTTAGGATATGAAAACAAGAA
VPS13_ARS305_3' rev	TTATATGTTTTGTTATGTAT TGTTTAT TTTCCCTTTAATTTTAGGATATGAAAACAAGAA
VPS13_ARS305_5' rev	TTATATGTTTTGTTATGTAT AATAAACAA TTCCCTTTAATTTTAGGATATGAAAACAAGAA
VPS13_ARS305_5',3' rev	TTATATGTTTTGTTATGTAT AATAAACAA TTCCCTTTAATTTTAGGATATGAAAACAAGAA
VPS13_ARS305_5' mut	TTATATGTTTTGTTATGTAT CT CTATTTTCCCTTTAATTTTAGGATATGAAAACAAGAA
VPS13_ARS305_ACS mut	TTATATG GGT TGTTATGTAT TGTTTAT TTTCCCTTTAATTTTAGGATATGAAAACAAGAA
ARS 305 ACS sequence	TTATATGTTTT *****
VPS13_ARS305 wt	TTTATCAAAGAAAAAATCTTAGCTTTAAGAACTACAA GTAAATA AAAAATAATAAATC
VPS13_ARS305_3' rev	TTTATCAAAGAAAAAATCTTAGCTTTAAGAACTACAA TTATTTACT AAAAATAATAAATC
VPS13_ARS305_5' rev	TTTATCAAAGAAAAAATCTTAGCTTTAAGAACTACAA GTAAATA AAAAATAATAAATC
VPS13_ARS305_5',3' rev	TTTATCAAAGAAAAAATCTTAGCTTTAAGAACTACAA TTATTTACT AAAAATAATAAATC
VPS13_ARS305_5' mut	TTTATCAAAGAAAAAATCTTAGCTTTAAGAACTACAA GTAAATA AAAAATAATAAATC
VPS13_ARS305_ACS mut	TTTATCAAAGAAAAAATCTTAGCTTTAAGAACTACAA GTAAATA AAAAATAATAAATC

VPS13_ARS305 wt	ACACCGGACAGTACATGAAACT
VPS13_ARS305_3' rev	ACACCGGACAGTACATGAAACT
VPS13_ARS305_5' rev	ACACCGGACAGTACATGAAACT
VPS13_ARS305_5',3' rev	ACACCGGACAGTACATGAAACT
VPS13_ARS305_5' mut	ACACCGGACAGTACATGAAACT
VPS13_ARS305_ACS mut	ACACCGGACAGTACATGAAACT

S4 Fig. Full sequences of ARS607 (A) and ARS305 (B) inserted into VPS13 locus are shown. Modified or deleted nucleotides are highlighted in red and Fkh1/2 consesnsus sequences are highlighted in turquoise. The inserted sequences are indicated in **bold and underlined**.