Supplementary Table S1. Details of a set of 40 faba bean genotypes collected from six countries and used in this study

Genotype		Origin (country/region/state)	Pedigree
Cultivars	Fiord	Greece	Seln ex landrace
	Ascot	Greece	Seln ex Fiord
	Doza	Narrabri, NSW	SP01040 (Acc 157 × STW)
	Cairo	Narrabri, NSW	Seln ex ILB2282
	Icarus	Adelaide, SA	Seln ex BPL710
	PBA Warda	Narrabri, NSW	SP99046 × SP99081
	PBA Rana	Adelaide, SA	Manafest × (Acc611 × (Manafest)
	PBA Nasma	Narrabri, NSW	IX38/1-09 × IX4/16
	11NF001a-6	Narrabri, NSW	IX220d/2-5×IX114/1-16
Australian breeding lines	11NF014b-1	Narrabri, NSW	IX477/17-17×IX220d/2-5
	IX486/7-6	Narrabri, NSW	IX220d/2-5×IX338c/2-1
	IX474/4-3	Narrabri, NSW	IX114/1-16×AF04085
	IX561f-4-2	Narrabri, NSW	IX364b-2-4×IX368i-2-2
	IX552Rb-2-4	Narrabri, NSW	IX342f/3-4×IX306/5-3
	IX524Rb-2-1	Narrabri, NSW	AF05069×IX306a-5-3
	IX525c-1-10	Narrabri, NSW	IX342f-3-4×AF05069
	IX553Rc-2-4	Narrabri, NSW	IX346f-3-1×IX306a-5-3
	IX585c/1-11	Narrabri, NSW	AC0972/4032×AF05060
	IX114#15033	Narrabri, NSW	SP99046×SP99081
	AF03109	Adelaide, SA	278//974/722
	AF10089	Adelaide, SA	AF03029 × (683x834)
	AF08161	Adelaide, SA	Complex pedigree
	AF09167	Adelaide, SA	IX38AR × Nura
	Det-2	Narrabri, NSW	Seln determinate
Australian field selections	Doza#14916	Tamworth, NSW	Seln ex Doza
	Doza#12034	Tamworth, NSW	Seln ex Doza
	Cairo seln#7	Tamworth, NSW	Seln ex Cairo
	Ac1655	Spain	Seln ex V-300
Germplasm accessions	Ac1227#14908	Ecuador	Seln ex ILB5291
	Ac1221#14910	Ecuador	Seln ex ILB5282
	Ac1594#5004	Morocco	Seln ex ILB4720
	Ac1228#14902	Ecuador	Seln ex ILB5294
	Ac1231#14905	Ecuador	Seln ex ILB5298
	Ac740	Ecuador	Seln ex ILB3034
	Ac1866#15013	Ecuador	Seln ex ILB5289
	Ac1257#14904	Ecuador	Seln ex ILB5353
	Ac0973#4902	Ecuador	Seln ex ILB3025
	Ac1206#4919	China	Seln ex ILB5220
	Ac1269#8127	China	Seln ex BPL710
	Ac0805#4912	Yemen	Seln ex ILB445

Supplementary Table S2. Primer sequences of allele specific markers used for mapping of *Uvf-2* and *Uvf-3*

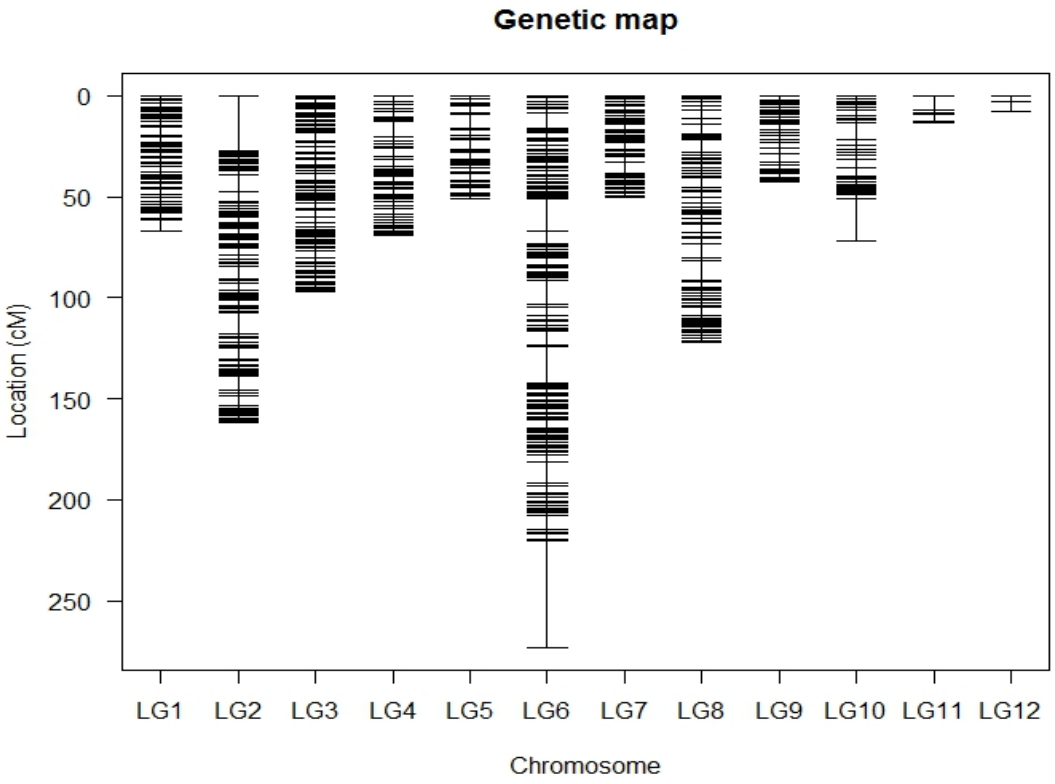
KASP markers	[a]Allele-1 primer	[b]Allele-2 primer	Common primer	SNP
Fiord/Doza#12034 (q_rust_Doza)				
KASP_Vf_0206	tggtgactcttttgctctaaca	tggtgactcttttgctctaact	tttcaatccaaaatcgatgc	A/T
KASP_Vf_0507	gagcaccactccaccacag	gagcaccactccaccacaa	tccagtaaccccgaatgaag	G/A
KASP_Vf_0198	atgacagaaacttagaaaaact	gatgacagaaacttagaaaaacc	cactctcaaccgccaaacac	T/C
KASP_Vf_0703	cctttgtttttcttggtttcaa	cctttgtttttcttggtttcag	agcatattttctcctctttccc	A/G
KASP_Vf_0618	tccgacataagtatctctga	tccgacataagtatctctgg	catcgacatccgtctccaat	A/G
KASP_Vf_0493	agaacgggacctttgtataa	agaacgggacctttgtatag	aagctaaggtgattggcacag	A/G
KASP_Vf_0063	tctctcaatctccactttgttg	tctctcaatctccactttgttc	agccatggtgagagtgaggt	G/C
KASP_Vf_0685	aattcgattcggggtcg	caattcgattcggggtca	cttctgagatttgttcaataag	G/A
KASP_Vf_0498	cagttgtttgaaagtggagttg	cagttgtttgaaagtggagttc	caaagtagctccagtgataa	G/C
KASP_Vf_0146	agaaaatcgggtggacagat	agaaaatcgggtggacagac	tgtacaggaggtttcaggatca	T/C
KASP_Vf_0035	tcaccaccatcaacattctgt	caccaccatcaacattctgc	ggtttaggttgccggattc	T/C
KASP_Vf_1042	ccgtggctgctgttgct	cgtggctgctgttgcc	ccacagccgagtctgtcttt	T/C
KASP_Vf_0151	atttagccgcctttagagca	atttagccgcctttagagcg	gctcttgttgttgttcccttg	A/G
KASP_Vf_0997	ggaaaccaatggtttcacca	ggaaaccaatggtttcaccg	gaaactcgggagtggtgttc	A/G
KASP_Vf_0032	cacatgggaaggatgctga	acatgggaaggatgctgg	gcctattctatttctgctta	A/G
KASP_Vf_0403	ggaccttgcccagttgttag	ggaccttgcccagttgttaa	acccttttgattgaccggata	G/A
RNA-Seq				
KASP_C198227	tggatgtcaaatgccaaggt	ggatgtcaaatgccaagga	gttaccgcaaaccacaactg	T/A
KASP_C233649	tctataattgcagaaagtgtaagatagtca	ctataattgcagaaagtgtaagatagtcg	caactcacccaggtctatgg	A/G
KASP_C225873	aatttttgagcaactgggtagaat	aatttttgagcaactgggtagaac	caagttttccaactgtctcaagg	T/C
KASP_scaffold3124	gtttcagaaatcagcaaacacg	gtttcagaaatcagcaaacaca	cttggtcagtttggtggaca	G/A
KASP_C241205	tccatcatcacctccaacaac	ccatcatcacctccaacaaa	ccgaggatggagattaggaa	C/A
KASP_C174045	caaagattttgctacctccgt	caaagattttgctacctccgg	ttcctgatggatccccttc	T/G
KASP_C239085	gtaatcataacttggtcgtttttctatc	gtaatcataacttggtcgtttttctata	gccatgaacatgcaactgtc	C/A
KASP_C250539	aatacaggatgtggtgtgtcagag	acaggatgtggtgtgtcagaa	gatgcttgtggttgtgatgag	G/A
KASP_C241629	ctacatcatcttgttcaatctcacc	gtctacatcatcttgttcaatctcact	ccatggaagaagatggaagg	C/T
KASP_C150949	aatccagagagccagcacc	aatccagagagccagcact	aatcctctcgacctctttcc	C/T
KASP_C244859	aacgcacattccacttcca	cgcacattccacttccg	ttgaggtgcggagagattg	A/G
KASP_C208897	caatacctcattaaacaccaagtataaaat	caatacctcattaaacaccaagtataaaaa	tcttttctcacgagggacctt	T/A
KASP_C246203	gtatccaattcaagcaccgag	gtatccaattcaagcaccgaa	gcgtcggagaagttttcaac	G/A
KASP_C229467	ggtggagtggaacatgctagt	ggtggagtggaacatgctagc	tcacacacgtctcctcaaca	T/C
Fiord/Ac1655 (q_rust_Ac1655)				
KASP_Vf_0096	cttatttggtgtcctggttagg	tcttatttggtgtcctggttaga	ccaacattgaaatatgggttg	G/A
KASP_Vf_0110	ctcattctaaccaggat	ctcattctaaccaggac	cccttcctgttgtgttcaat	T/C
KASP_Vf_0565	cacaatttgtagccttgccac	cacaatttgtagccttgccat	cggatacgaaaagcaaggac	C/T
KASP_ACxF213	catcagttgaatttaaaac	catcagttgaatttaaaat	agcgttgaattgaatttatgga	C/T
KASP_ACxF40	aagggctgcagatcttacgtt	aagggctgcagatcttacgtc	atccgggttctccgtagagt	T/C
KASP_ACxF260	gcgattgaccttcttggg	ggcgattgaccttcttgga	tgatcagcaagcattaacactg	G/A
KASP_ACxF275	ctattacatgtttatactta	ctattacatgtttatacttc	gtacgatcaagagagagatc	A/C
KASP_ACxF165	ggcctttctccaataattac	ggcctttctccaataattat	tcactctcaggtatctcccgta	C/T
KASP_Vf_0592	gtgtttttggcaatttagaaa	gtgtttttggcaatttagaag	gcattgatagtagacatgag	A/G
KASP_Vf_1319	ctgttgttgtgtacattcag	ctgttgttgtgtacattcaa	aaccgaacgtaagtgccttg	G/A
KASP_ACxF140	gaaaaggtgcgtaaagcaaa	gaaaaggtgcgtaaagcaac	acagtataccaggcaacaac	A/C
KASP_ACxF135	aatgtacacccttgagcttgc	caatgtacacccttgagcttga	atggttggagcaggattttg	C/A
KASP_Vf_1090	ctcgacaacttcaactcctttg	ctcgacaacttcaactccttta	ccagacaaagcaaacctatgg	G/A
KASP_ACxF138	ttcggggacataatcttacca	ttcggggacataatcttaccg	actcatcgcccacaagaagt	A/G
KASP_Vf_1318	gcttacaacttcaaaaaaa	gcttacaacttcaaaaaag	gggtttcctcttgagagtgttc	A/G
KASP_Vf_0257	gctgaggggaagacaacga	ctgaggggaagacaacgg	aacttttccctatacgtagg	A/G
KASP_Vf_0203	aaaattcccttgtccactcaaa	aaaattcccttgtccactcaac	aaacataaagggatgtgccagt	A/C
KASP_ACxF157	ggtcagggaggacgatgaa	ggtcagggaggacgatgag	cacttaacctccgtgagtcca	A/G
KASP_ACxF327	gactttcaggagaagactgg	gactttcaggagaagactgt	atgcaaagtagggcgaggta	G/T
KASP_Vf_0457	gtcctgaaccataagcaaatga	gtcctgaaccataagcaaatgg	aatcagctatcatgaccaccgc	A/G

[a]Allele-1 primer labelled with FAM: gaaggtgaccaagttcatgct

[b]Allele-2 primer labelled with HEX: gaaggtcggagtcaacggatt

Supplementary Table S3. Linkage group (LG) statistics for Fiord/Doza#12034 RIL population for SNPs detected from RNA-Seq

LGs	Number of SNPs	Length of LG (cM)	Avg. SNP density (cM)
1	222	66.82	0.301
2	586	161.62	0.276
3	332	96.96	0.292
4	209	69.1	0.331
5	129	50.84	0.394
6	583	273.1	0.468
7	162	50.56	0.312
8	209	122.14	0.584
9	168	42.3	0.252
10	134	72.13	0.538
11	43	13.19	0.307
12	7	7.83	1.119
Total	2784	1026.59	0.369



Supplementary Figure S1. GBS-t based linkage groups (LG) of Fiord/Doza#12034 RIL population