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*Identifying genetic components controlling fertility in the outcrossing grass species perennial ryegrass (*Lolium perenne*) by quantitative trait loci analysis and comparative genetics*

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Supplementary material

Thermal cycling conditions

(A) 1 minute (min) at 94°C, followed by 10 cycles of 1 min at 94°C, 1 min at 60°C (with the temperature reduced by 1°C per cycle), 1 min at 72°C, followed by 30 cycles of 1 min at 94°C, 1 min at 50°C, 1 min at 72°C (LpCk2a-1, Hd3a);

(B) as (A) except with a 2 min extension (06g10880, 06g11020 and 06g11180);

(C) 1 min at 94°C, followed by 30 cycles of 1 min at 94°C, 1 min at 60°C, 1 min at 72°C (LpVrn-1).

PCR products were scored as polymorphisms on agarose gels except for Hd3a(gt) on the F2 population which was amplified using a fluorescently labelled primer pair and run on an ABI3100 capillary sequencer.

Table S1 Primer sequences used in PCR amplifications

Marker	Forward primer 5'.....3'	Reverse primer 5'.....3'
LpCk2a-1	AGGTGCTTGGAACAGATGGG	TGTTTTCCGCTGCTTTCCT
LpVrn-1	AGCGGATCGAGAACAAGATC	AGCTGGCGGGTCTGGA
Hd3a(gt)	CAGGGTGTGCAAGCAGAACT	AGCAGGAGCTACCTGGATGA
Hd3a(LD)	TGCATCCCGTCCACATGATAGATC	CTGGAGCAGGAGCTACCTGGATG
06g10880	GAGGTAGCAAACTGAAGGA	TTCTGTAGCATTTCACCTG
06g11020	AAGAAGCAGAAGAAGCGCTA	CTTCAGGACATCCTCCAAAC
06g11180	AAAAGCCTCCATTGCTTGTC	CTGAATGCGAGTGAAGCTAA

Table S2 Genetic maps of chromosomes 4 and 7 from the F2/WSC and ILGI mapping families. Genetic distances are given in cM.

F2/WSC				ILGI			
Chromosome 4		Chromosome 7		Chromosome 4		Chromosome 7	
PSR580	0.0	INV1:2	0.0	R2702B.1	0.0	E38T47290	0.0
rv0992	2.1	R2869	6.4	E38M50348	18.3	PSR119	3.8
E42M3311	4.5	B6102	9.4	C1164	20.0	E41T4761	3.9
rv0068	7.1	CDO545	12.3	E38T50350	24.5	E35T59465	17.3
PSR115	11.2	OSW	18.7	PSR580	24.6	CDO545	18.8
rv0454	19.8	LpFp1	25.2	BCD1421	26.0	OSW	29.2
LpCK2a-1	27.3	LpFp2	25.9	PSR305	27.6	LpHd3a	34.8
rv0966	28.5	LpFp3	27.1	C764.1	29.8	O6g11020	40.1
LpVRN-1	30.1	C764	27.4	R3182	32.1	O6g11180	40.2
rv0684	31.1	LpHd3a	28.4	CDO241	32.7	E41T47600	40.7
Rz395	32.7	LpFp4	28.9	E33T50247	34.6	E35T59420	42.3
BCD808	36.4	ACA_CAC_225	33.8	R1538	38.7	R1562	44.1
RYE12	38.0	O6g10880	34.3	E41T50710	39.4	E33T62108	45.6
PSR922	41.9	ACA_CTA_254	35.0	R2847.1	44.5	RZ144	46.0
C746	42.7	RZ144	35.3	R2847.2	44.5	PSR150	46.5
E41M5708	45.5	ACA_CTA_321	35.7	PSR922	46.9	R1394A	48.5
E41M5702	46.5	O6g11020	35.9	PGM	46.9	CDO99	48.9
E38M4706	48.3	S2539	36.9	R2880	47.7	E33T6270	49.1
CDO795	49.0	E40M5909	37.4	CDO122.1	48.6	BCD349	50.2
E38M4705	49.4	E37M5601	43.0	CDO542.2	49.3	C30a	50.5
rv0380	50.2	GSY60.1	43.3	E41T47132	50.2	CDO385.1	50.8
ADH	51.1	CDO385.1	43.5	E33T6178	53.5	E41T50144	51.1
RZ537	51.7	PSR690	44.9	CDO795	58.8	PSR154	51.6
Fp41	53.2	RZ952	46.6	E38T50420	58.9	PSR690	53.0
rv0074	53.6	C390	47.9	PSR144	60.8	E33T62760	53.4
CDO1380.1	55.2	LtCOa	54.2	E33T5088	62.0	E38T50244	55.7
R2702B	58.0	E41M5701	55.4	rbcS	64.7	E41T47520	56.9
CD0938	59.6	LtCOb	56.9	E38T50640	65.3	E38T50388	57.8
rv1190	63.0	E39M5802	58.4	CDO938	67.6	E33T62272	58.2
PSR163	63.5	ACA_CAC_246	59.7	PSR163	67.9	LP1	58.3
E39M4905	65.9	ACA_CTA_204	68.9	E38T50218	68.7	E41T47300	63.4
E42M3303	66.7	ACP	84.9	CDO38.2	69.3	ACP2	68.7
E42M3313	67.9	CAT	103.1	C913a	72.2	E41T50970	77.4
rv0190	85.4			C1176.1	72.7	E41T47395	97.0
CDO20	86.5			E33T62402	73.8		
B6105	87.6			CDO1387	73.8		
rv0061	91.0			ablpg60	74.4		
E39M4904	93.2			E35T59310	75.2		
rv0382_2	111.8			E41T47208	77.3		
				E33T5065	81.7		
				CDO20.1	83.5		
				E41T47148	84.0		
				E38T5074	85.2		
				E41T50320	93.1		
				E33T50144	93.7		
				E38T50263	96.3		
				E33T61228	97.6		
				E38T4785	99.6		