Supplemental Table S1. Fatty acid composition of mature seeds harvested from plants grown under Control, LS70, LS53, or LS32 conditions.

	Fatty acid composition (mg g^{-1} DW)									
	C16:0	C16:1	C18:0	C18:1	C18:2 (ω6)	C18:3 (ω3)	C20:0	C20:1	C22:0	C22:1
	palmitic	palmitoleic	stearic	oleic	linoleic	linolenic	eicosanoic	gadoleic	behenic	erucic
Control	18.3 ±0.2	1.2 ±0.0	7.8 ±0.2	264.3 ±4.1	87.3 ±1.4	46.4 ±1.1	2.6 ±0.1	5.3 ±0.1	1.4 ±0.0	0 ±0.0
LS70	18.2 ±0.3	1.2 ±0.0	7.9 ±0.1	266.2 ±4.8	85.6 ±1.3	44.3 ±0.8	2.7 ±0.1	5.4 ±0.1	1.5 ±0.0	0 ±0.0
LS53	18.7 ±0.2	1.2 ±0.0	**7.2 ±0.1**	256.7 ±1.9	**79.1 ±1.1**	**41.1 ±0.8**	2.6 ±0.0	5.3 ±0.1	**1.6 ±0.0**	0 ±0.0
LS32	**19.4 ±0.4**	**1.5 ±0.0**	**6.6 ±0.3**	**178.5 ±4.3**	**57.3 ±1.2**	**28.3 ±0.8**	2.6 ±0.0	**3.8 ±0.1**	**1.6 ±0.0**	0 ±0.0

The values are shown as mean ± SE ($n = 6$ for control, $n = 4$ for LS70, LS53 and LS32). Significant differences from the control values are indicated in bold ($p < 0.05$).

Supplemental Table S2. Significantly changed proteins in LS70, LS53 and LS32 mature seeds assigned to unknown function or unidentified by mass spectrometry.

Spot n°	Protein name	LS70		LS53		LS32		Species	NCBI accession numbers	log (E value)	CV (%)	Exp. pI	Exp. Mr (kDa)	Theo. pI	Theo. Mr (kDa)
Unknown function															
70	Unknown	-1.0		-1.5	*	-2.2	**	At	15220526	-14.0	30	5.8	31.3	6.22	27.29
112	Unknown	-1.9	**	-1.4	*	-1.6	**	Eh	312283013	-14.9	18	5.4	64.0	5.61	51.79
123	Unknown	-1.3	**	-1.3	*	-1.8	**	Al	297791153	-29.9	20	5.8	34.9	7.07	27.90
128	Unknown	1.7	**	1.3	*	-1.0		Al	297816624	-45.5	24	5.2	89.9	5.07	89.94
130	Unknown	-1.1		-1.2	*	-1.7	**	At	15220526	-15.2	26	5.9	31.2	6.22	27.29
135	Unknown	1.4		1.7	**	1.5	**	Pm	205830697	-5.4	92	5.9	27.0	5.81	1.39
150	Unknown	1.3	**	1.1		-1.2		Eh	312282237	-53.1	28	5.1	84.9	4.95	80.07
172	Unknown	-1.1		-1.1		-1.5	**	Br	119720748	-5.6	21	6.3	17.2	5.94	17.66
178	Unknown	-1.5		-1.4	**	-1.3	*	Al	297842743	-54.7	38	5.5	49.6	5.49	42.12
192	Unknown	1.2		-1.2		-1.3	*	Al	297831644	-25.4	10	5.8	90.9	6.58	108.47
Unidentified															
2		-6.0	**	-7.3	**	-1.5						5.8	58.0		
3		-1.1		-2.2		-5.9	**					8.7	42.5		
15		1.6	*	1.1		3.1	**					4.6	52.5		
20		-1.3		1.3		2.4	**					5.5	38.0		
24		1.0		-1.2		-3.0	**					5.7	26.2		
28		-1.1		-1.7		-2.9	**					8.2	44.1		
39		-1.1		-1.4	*	-2.6	**					6.3	71.7		
50		1.1		2.0	**	2.4	**					5.5	40.1		
60		-1.1		1.5		2.1	**					5.5	38.7		
67		-1.0		1.1		2.2	**					6.5	43.8		
78		1.3	*	-1.2		-1.7	**					5.4	26.0		
84		1.2		1.5		2.0	**					6.4	35.9		
90		1.3		1.0		-1.5	**					5.1	33.1		
93		-1.7	*	-1.3		1.2						5.3	38.6		
94		1.3		-1.2		-1.5	**					6.1	83.8		
102		-1.3		-1.9	**	-1.3						6.1	62.3		
103		1.9	**	1.1		1.0						5.1	53.9		
107		1.6	*	1.7		1.9	**					4.4	16.3		
114		-1.2		1.0		1.6	**					6.7	27.5		
115		1.1		-1.1		-1.7	**					6.4	83.4		
116		1.5		1.3	*	1.8	**					5.0	59.1		
119		-1.8	*	-1.3		-1.1						6.5	68.8		
126		1.0		1.1		1.8	**					6.0	50.0		
134		-1.5	*	1.0		1.1						5.4	37.6		
146		1.1		1.7	**	1.4						6.0	24.2		
149		1.3		1.4	**	1.6	**					5.1	16.1		
151		-1.0		-1.1		-1.6	**					5.2	33.4		
154		-1.2		1.1		1.4	**					6.2	30.0		
155		1.3		-1.2	*	-1.0						6.1	84.7		
156		1.1		-1.3	*	-1.5	**					6.3	84.5		
183		1.1		-1.3	*	1.2						6.1	62.5		
186		-1.4	**	-1.0		1.0						5.4	38.4		
193		-1.0		1.4	*	1.3						6.4	16.6		
204		-1.4	**	-1.1		-1.0						6.7	51.7		
206		1.4	*	1.3	*	1.3	**					5.1	28.7		
215		1.1		1.2	*	1.3	**					5.1	28.0		

Proteins up-regulated and down-regulated are marked in red and green, respectively. Significant ANOVA was followed by a Mann–Whitney test (p < 0.05) carried out on the normalised spot volumes (*n* = 6 for control, *n* = 4 for LS70, LS53 and LS32). Values indicate fold changes in protein abundance in LS seeds compared to control seeds in a linear scale. *, **: Significant differences from the control were at p < 0.05 or p < 0.01, respectively. The assigned best–matched protein is listed with the organism in which it was identified and its GenBank protein accession number. The log(Evalue), the percentage of sequence coverage (CV) and experimental (Exp.) and theoretical (Theo.) p*I* / *Mr*, obtained are also indicated.