Supplementary Materials

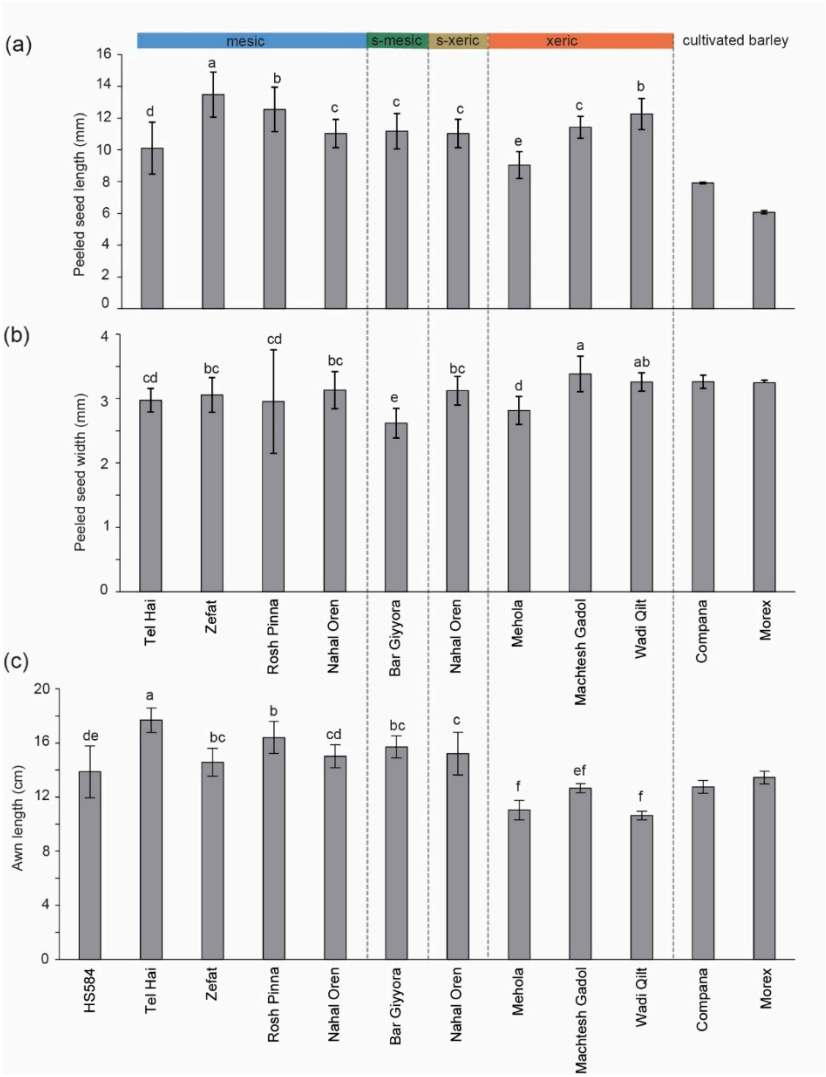

Figure S1. Phenotypic analysis of dry seeds of wild barley accessions originating from Israel. **Supports Figure 2. (a)** and **(b)** Quantitative data for peeled seed length and seed width. (**c**) Quantitative data for awn lengh. The ecological conditions for the sampling site of HS584 are unknown. s-mesic = semi-mesic, s-xeric = semi-xeric. Compana and Morex represent two- and six-rowed cultivated barley controls, respectively. Data are the means (±SD) from three biological repetitions, each with at least 20 seeds. One-way analysis of variance (ANOVA) was made separately for each tested parameter. Values marked with the same letter do not differ according to Duncan multiple range test ($p \leq 0.05$).

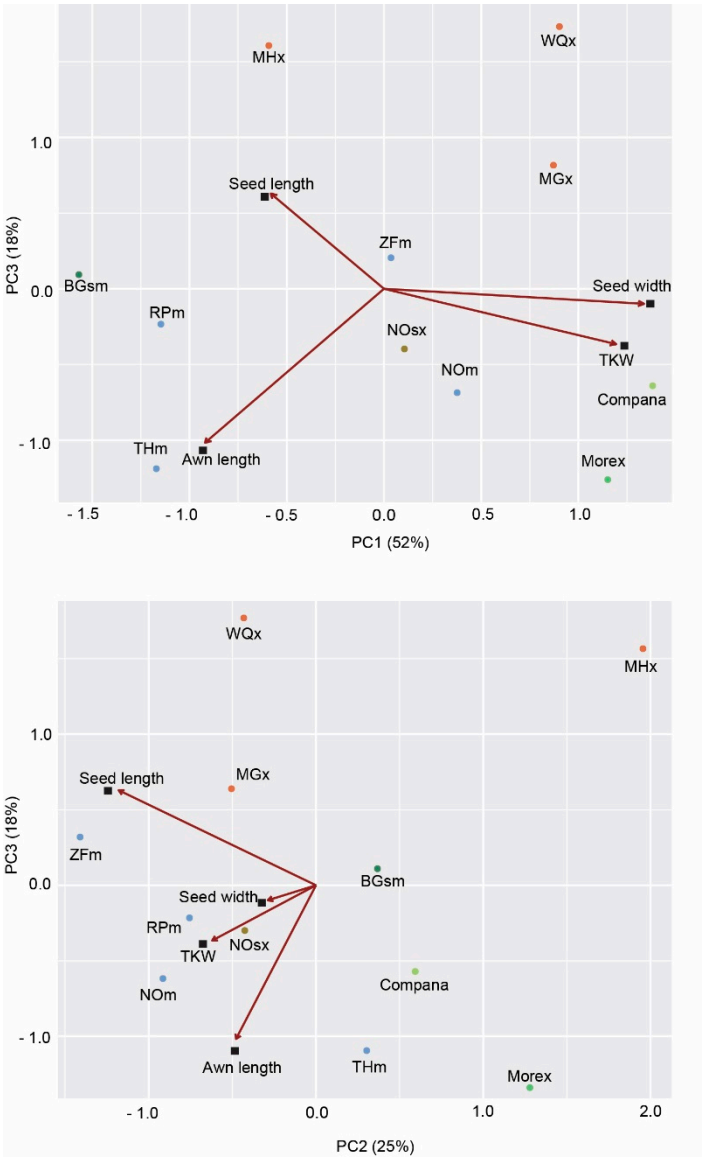

Figure S2. Principal component (PC) analysis of TKW, seed length and width for peeled seeds, and awn length. **Supports Figure 2.** The positions represent contribution rates of three PCs.

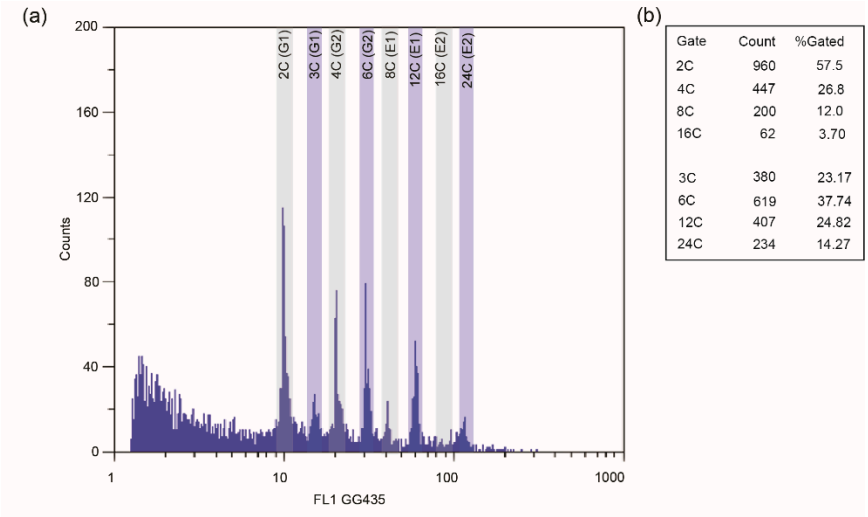

Figure S3. An example showing the interpretation of histograms of nuclear DNA content. **Supports Figures 3 and 4**. (**a**) Representative gated histogram obtained from 20 DAP whole peeled wild barley seed accession HS584. Histogram shows the gated C-value peaks for diploid seed tissue (a mixture of an embryo and seed maternal tissues; 2C = G1, 4C = G2, 8C = E1 = first endocycle, and 16C = E2 = second endocycle) and triploid endosperm tissues (3C = G1, 6C = G2, 12C = E1 = first endocycle, and 24C = E2= second endocycle) marked as gray and blue colored shading, respectively. The x-axis shows relative fluorescence intensity on log3 scale and y-axis number of measured particles (counts). The gates were created in FloMax program (Sysmex-Partec). The same gates were used for all evaluated samples of this study. (**b**) Table shows the number of particles per each gate collected from the histogram presented in (a).

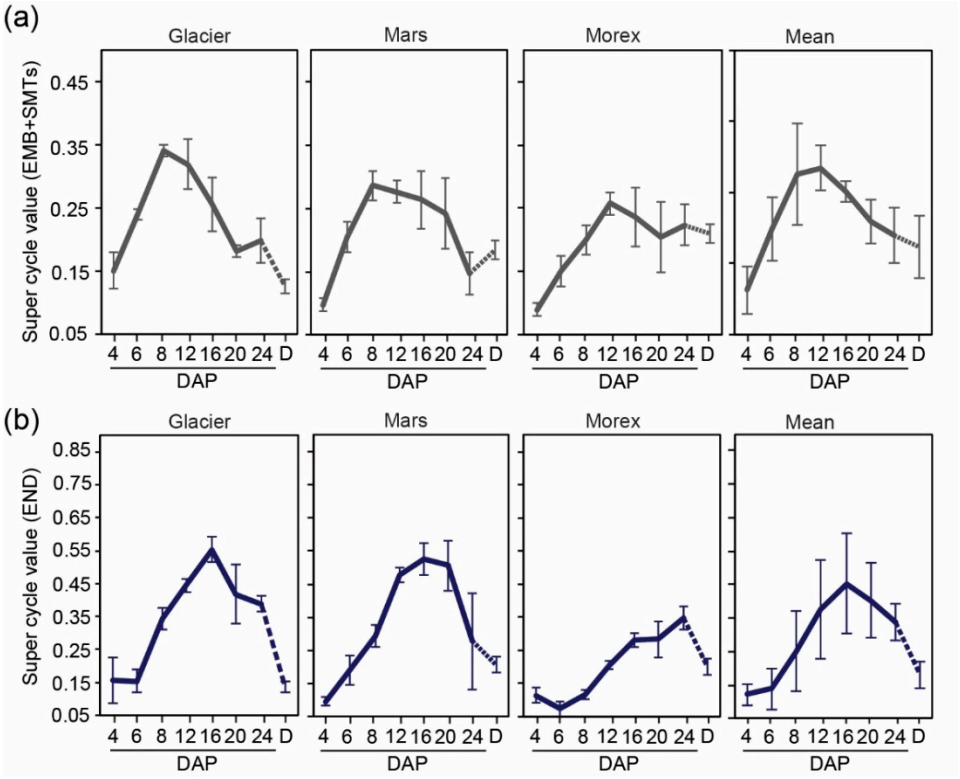

Figure S4. Comparison of super cycle values in seed tissues of three six-rowed barley cultivars. **Source data for Figure 4**. (**a**) and (**b**) show data for embryo/seed maternal tissues (EMB + SMTs) versus endosperm (END), respectively. Data are the means (±SD) from three biological replicates, each with at least five individual measurements. Mean = mean of super cycle value calculated between all cultivars. The dash-line between 24 DAP and dry seed samples means that seed development continued after 24 DAP.

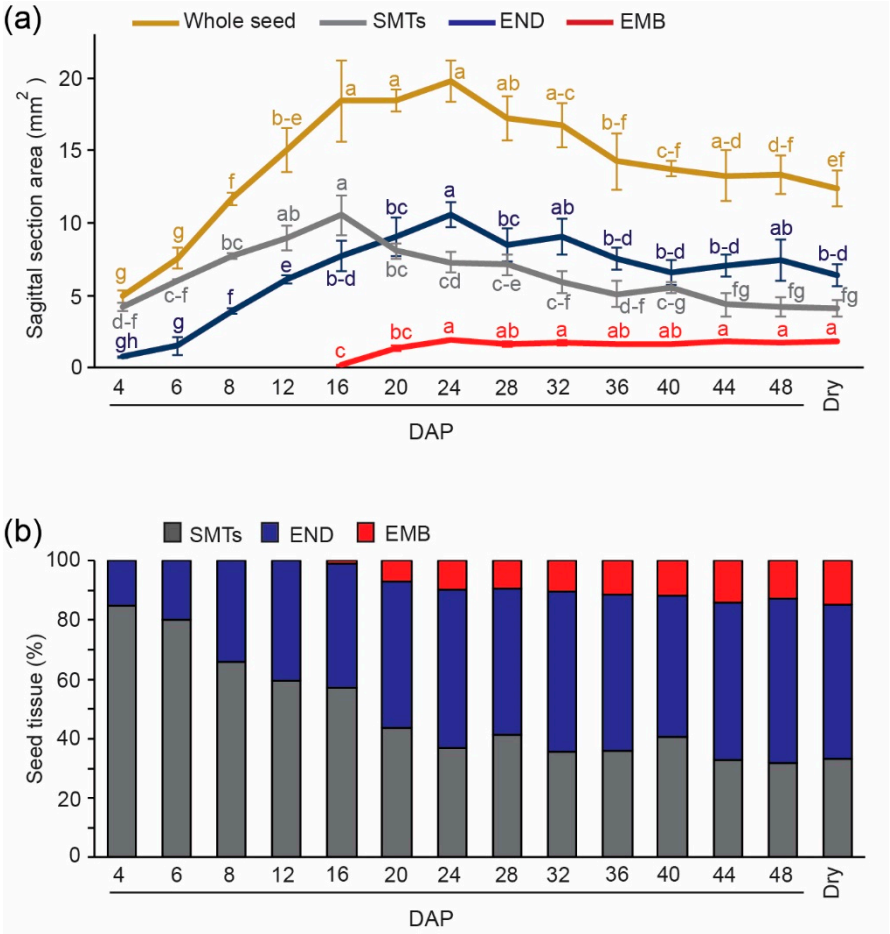

Figure S5. Time-course study of wild barley HS584 seed growth. **Supports Figure 6a.** (**a**) Measurements of sagittal section area of the whole seed, seed maternal tissues (SMTs), endosperm (END) and embryo (EMB) from 4 to 48 days after pollination (DAP) and in dry seed. Four to twelve DAP embryos were not analyzed for technical reasons. Data are the means from ≥20 individual measurements. ANOVA was made separately for each parameter. Values marked with the same letter do not differ according to Tukey's test ($p \leq 0.05$). (**b**) Cumulative percentage of major seed tissues calculated based on (a).

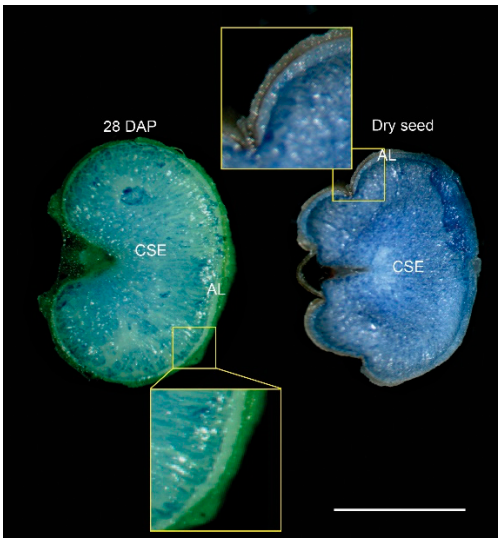

Figure S6. Analysis the aleurone layer viability. **Supports Figure 6b**. Selected transverse sections of 28 DAP and dry wild barley HS584 seeds stained with 0.1% Evans blue. AL = Aleurone layer, CSE = central starchy endosperm. Scale bar = 5 mm.

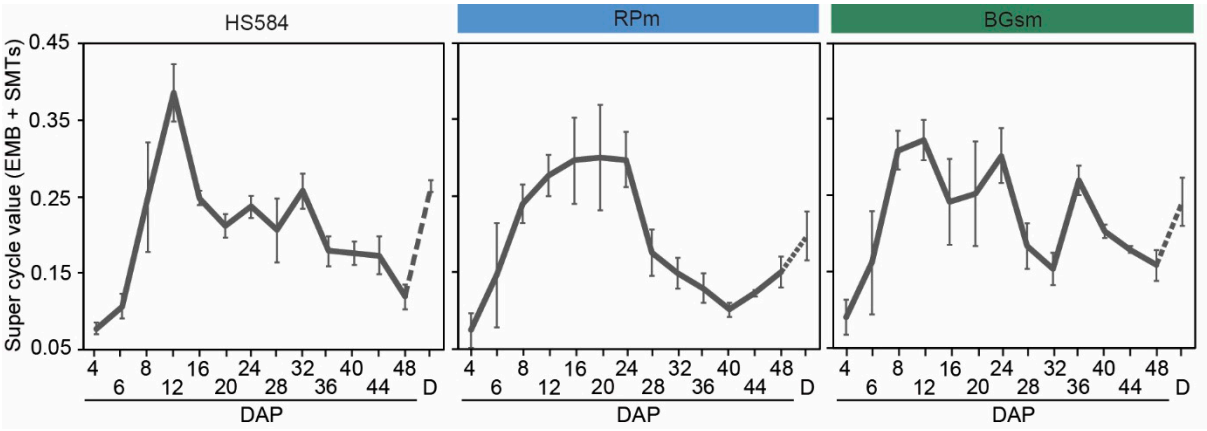

Figure S7. Comparison of super cycle values in diploid seed tissues (embryo + seed maternal tissues; EMB+SMTs) of three selected wild barley accessions at given DAP. D = Dry, RPm = Rosh Pinna, BGx = Bar Giyyora. **Complements Figure 6c**. Data are the means (±SD) from three biological replicates, each with at least five individual measurements. The dash-line between 48 DAP and dry seed samples means that seed desiccation continued after 48 DAP.

Tables S1. Percentage of 2C, 4C, 8C and 16C nuclei at a given DAP and in dry seeds in diploid seed tissues represented by the embryo (EMB) and seed maternal tissues (SMTs). **Supports Figure 3a.** Values are the means from 3 biological replicates, each with at least 5 measurements (seeds) ± SD. Blue color = mesic; green color = semi-mesic; green-brown color = semi-xeric; orange color = xeric.

4 DAP

	HS584	THm	ZFm	RPm	NOm	BGsm	NOsx	MHx	MGx	WQx
2C	42.9 ±2.98	42.1 ±1.85	48.7 ±0.16	45 ±2.4	48.2 ±0.72	43.6 ±2.86	47.5 ±1.8	45.8 ±0.79	51.5 ±0.23	49.4 ±0.54
4C	47.3 ±1.7	49.6 ±1.44	44.1 ±1.03	48.3 ±0.92	44.5 ±1.01	48 ±2.09	45.2 ±1.11	48.6 ±0.49	42.7 ±0.53	45.4 ±0.26
8C	9 ±1.39	7.6 ±1.3	6.7 ±0.92	5.9 ±1.85	6.6 ±0.81	7.7 ±0.89	6.5 ±0.63	4.9 ±1.11	5.2 ±0.26	4.7 ±0.29
16C	0.9 ±0.13	0.6 ±0.04	0.5 ±0.05	0.8 ±0.24	0.7 ±0.03	0.7 ±0.09	0.8 ±0.12	0.7 ±0.08	0.7 ±0.09	0.5 ±0.01

6 DAP

	HS584	THm	ZFm	RPm	NOm	BGsm	NOsx	MHx	MGx	WQx
2C	33.1 ±4.83	39 ±2.92	44.6 ±3.1	38.6 ±2.86	41.8 ±3.17	35.9 ±1.62	42.7 ±1.86	42.1 ±1.12	49.3 ±2.18	44.4 ±0.24
4C	45.6 ±0.82	48.9 ±1.89	44.3 ±1.06	48.7 ±2.07	43.7 ±1.84	49.3 ±1.02	47.2 ±1.35	48.9 ±0.42	42.4 ±1.47	45.8 ±0.87
8C	17.6 ±2.47	11 ±1.35	10.3 ±2.57	10.7 ±3.04	12.1 ±2.9	13.2 ±0.6	9.2 ±1.35	8 ±0.7	7.8 ±1.02	8.5 ±0.5
16C	3.7 ±2.37	1.1 ±0.25	0.8 ±0.07	2 ±1.89	2.4 ±2.17	1.5 ±0.26	0.9 ±0.09	1 ±0.19	0.5 ±0.11	1.4 ±0.48

8 DAP

	HS584	THm	ZFm	RPm	NOm	BGsm	NOsx	MHx	MGx	WQx
2C	30.1 ±2.49	35.9 ±2.82	37 ±3.64	33.6 ±2.08	42.6 ±0.58	33.8 ±1.01	37.7 ±1.62	40 ±2.03	35.9 ±0.97	42.8 ±2.31
4C	40.3 ±4.1	47.8 ±0.13	43.5 ±3.68	46.4 ±2.33	45.3 ±1.63	41.5 ±2.52	44.7 ±2.83	46 ±3.04	39.5 ±1.69	46.1 ±0.91
8C	20.7 ±2.15	14.6 ±2.62	16.4 ±4.17	15.9 ±0.99	10.5 ±1.01	18.6 ±1.44	13.7 ±2.59	10.5 ±0.85	20.7 ±1.13	10.1 ±2.29
16C	9 ±6.79	1.8 ±0.15	3.1 ±2.37	4 ±0.91	1.6 ±0.71	6.2 ±1.14	3.9 ±1.33	3.5 ±0.88	3.9 ±0.39	1 ±0.31

12 DAP

	HS584	THm	ZFm	RPm	NOm	BGsm	NOsx	MHx	MGx	WQx
2C	42.5 ±1.83	30.7 ±0.83	31.9 ±1.6	35.6 ±2.6	40.5 ±3.44	37.1 ±8.49	51 ±6.94	51.4 ±4.39	32.1 ±2.38	36.4 ±3
4C	34.1 ±1.29	41.8 ±0.75	36.9 ±3.64	42.3 ±2.48	37.2 ±2.15	37.2 ±5.77	33.2 ±7.05	32.4 ±1.98	38.3 ±0.51	34.9 ±2.16
8C	17.3 ±1.15	20.4 ±2.58	23.6 ±2.31	16.5 ±1.53	14 ±2.46	19.2 ±2.6	11.3 ±0.35	10.2 ±2.52	22.6 ±2.15	18 ±1.54
16C	6.2 ±0.84	7 ±1.3	7.5 ±1.64	5.5 ±1.59	8.2 ±1.25	6.5 ±0.2	4.5 ±1.01	6.1 ±0.41	7 ±0.66	10.6 ±3.89

16 DAP

	HS584	THm	ZFm	RPm	NOm	BGsm	NOsx	MHx	MGx	WQx
2C	51 ±0.19	38.5 ±7.08	50.9 ±2.39	45.8 ±3.28	50.6 ±1.61	51.8 ±11.07	51.4 ±7.86	51.9 ±2.2	40.8 ±5	45.8 ±6.76
4C	30.4 ±0.81	39 ±5.62	27 ±1	32 ±1.55	32.3 ±2.28	30.2 ±4.87	31.3 ±4.19	25.7 ±2.1	28.4 ±0.65	32 ±7.04
8C	11.9 ±0.71	16.1 ±3.46	13.2 ±1.72	14.7 ±1.41	10.6 ±1.93	11.8 ±4.96	11.9 ±2	11.2 ±0.87	20.1 ±3.51	14 ±2.02
16C	6.6 ±0.2	6.3 ±1.9	8.8 ±0.94	7.5 ±2.1	6.5 ±1.73	6.2 ±1.26	5.4 ±8.23	11.2 ±1	10.7 ±1.79	8.2 ±2.24

20 DAP

	HS584	THm	ZFm	RPm	NOm	BGsm	NOsx	MHx	MGx	WQx
2C	55.8 ±1.21	47 ±3.01	48.3 ±6	49.3 ±4.81	61.1 ±2.3	54.3 ±0.91	56.2 ±3	61.5 ±3.11	53.5 ±3.16	46.1 ±1.27
4C	28.5 ±2.07	35.5 ±3.1	28.7 ±0.56	29.1 ±2.06	27.1 ±2.27	27.9 ±0.64	29.2 ±1.14	23.9 ±1.51	28 ±0.99	25.9 ±1.29

8C	10.4 ±0.85	11.6 ±0.69	12.4 ±2.25	13.1 ±3.14	7.4 ±0.9	11.7 ±0.53	9.7 ±1.21	8.9 ±1.44	12.6 ±1.57	14.5 ±1.49
16C	5.3 ±0.47	6 ±0.93	10.5 ±4.35	8.5 ±1.87	4.4 ±0.66	6.1 ±0.79	4.9 ±0.66	5.8 ±0.61	5.9 ±0.93	13.5 ±0.96

24 DAP

	HS584	THm	ZFm	RPm	NOm	BGsm	NOsx	MHx	MGx	WQx
2C	53.2 ±1.52	47.9 ±3.04	49.3 ±3.86	51 ±1.41	60.8 ±4.82	51.2 ±2.23	57.3 ±1.72	57.1 ±3.94	48.4 ±4.82	47.8 ±1.41
4C	28.8 ±0.67	32.2 ±2.83	25.4 ±1.53	27.1 ±0.98	24.1 ±1.05	26.4 ±0.1	25.9 ±1.64	24.9 ±1.91	29.1 ±0.9	30.2 ±1.08
8C	12.3 ±0.73	12 ±1.57	13.8 ±1.41	14 ±0.73	9.8 ±2.91	14.5 ±1.43	11.3 ±1.15	11.2 ±0.94	15.1 ±3.48	15 ±0.71
16C	5.7 ±0.39	7.9 ±2.21	11.6 ±3.12	7.9 ±1.5	5.3 ±1.03	7.9 ±0.76	5.5 ±1.99	6.8 ±1.33	7.3 ±1.98	7 ±1.03

Dry

	HS584	THm	ZFm	RPm	NOm	BGsm	NOsx	MHx	MGx	WQx
2C	50 ±1.44	53.5 ±1.83	57 ±0.37	55.1 ±3.71	57.4 ±1.05	53.5 ±2.76	60.2 ±3.99	49.6 ±4.04	54.5 ±0.75	52.4 ±1.38
4C	28.4 ±0.97	28.3 ±1.15	28.2 ±0.75	28.7 ±1.27	28.9 ±1.32	27.4 ±2.23	27.6 ±1.34	29.7 ±2.32	28.4 ±0.57	27.8 ±0.79
8C	17 ±0.6	14.2 ±1.06	11.2 ±0.32	12.4 ±1.99	10.7 ±0.16	13.9 ±0.47	9.4 ±2.08	16.4 ±1.57	13.1 ±1	15.5 ±0.87
16C	4.7 ±0.31	4 ±0.3	3.6 ±0.2	3.8 ±0.49	3 ±0.3	5.2 ±0.33	2.8 ±0.73	4.4 ±0.18	3.9 ±0.15	4.3 ±0.31

Table S2. Super cycle values at a given DAP calculated for SMTs. **Supports Figure 3b.** Values are the means from 3 biological replicates, each with at least 5 measurements (seeds) ± SD.

	HS584	THm	ZFm	RPm	NOm	BGsm	NOsx	MHx	MGx	WQx
4 DAP	0.08 ± 0.01	0.09 ± 0.01	0.08 ± 0.01	0.07 ± 0.02	0.08 ± 0.01	0.09 ± 0.01	0.06 ± 0.01	0.07 ± 0.01	0.07 ± 0.00	0.06 ± 0.00
6 DAP	0.11 ± 0.02	0.13 ± 0.01	0.12 ± 0.03	0.15 ± 0.07	0.17 ± 0.07	0.16 ± 0.01	0.1 ± 0.01	0.1 ± 0.01	0.09 ± 0.01	0.11 ± 0.01
8 DAP	0.25 ± 0.07	0.18 ± 0.03	0.22 ± 0.07	0.24 ± 0.02	0.14 ± 0.02	0.31 ± 0.02	0.19 ± 0.01	0.18 ± 0.05	0.29 ± 0.02	0.12 ± 0.03
12 DAP	0.31 ± 0.04	0.35 ± 0.01	0.39 ± 0.03	0.28 ± 0.03	0.31 ± 0.01	0.32 ± 0.03	0.33 ± 0.03	0.22 ± 0.02	0.37 ± 0.03	0.39 ± 0.09
16 DAP	0.25 ± 0.01	0.29 ± 0	0.31 ± 0.02	0.3 ± 0.06	0.24 ± 0.05	0.24 ± 0.03	0.32 ± 0.07	0.23 ± 0.01	0.42 ± 0.07	0.3 ± 0.03
20 DAP	0.21 ± 0.02	0.24 ± 0.02	0.4 ± 0.01	0.3 ± 0.07	0.16 ± 0.02	0.25 ± 0.03	0.29 ± 0.01	0.2 ± 0.03	0.24 ± 0.03	0.42 ± 0.03
24 DAP	0.24 ± 0.01	0.28 ± 0.03	0.37 ± 0.05	0.3 ± 0.04	0.2 ± 0.05	0.3 ± 0.04	0.28 ± 0.03	0.25 ± 0.05	0.3 ± 0.07	0.29 ± 0.03
Dry	0.26 ± 0.01	0.22 ± 0.01	0.18 ± 0.01	0.2 ± 0.03	0.17 ± 0.01	0.24 ± 0.02	0.15 ± 0.01	0.25 ± 0.03	0.26 ± 0.02	0.24 ± 0.01

	mesic	semi-mesic	semi-xeric	xeric
4 DAP	0.08 ± 0.01	0.09 ± 0.01	0.06 ± 0.01	0.06 ± 0.01
6 DAP	0.14 ± 0.02	0.16 ± 0.01	0.1 ± 0.01	0.1 ± 0.01
8 DAP	0.19 ± 0.04	0.31 ± 0.02	0.19 ± 0.01	0.19 ± 0.08
12 DAP	0.33 ± 0.05	0.32 ± 0.03	0.33 ± 0.03	0.33 ± 0.09
16 DAP	0.28 ± 0.03	0.24 ± 0.03	0.32 ± 0.07	0.32 ± 0.09
20 DAP	0.27 ± 0.1	0.25 ± 0.03	0.29 ± 0.01	0.29 ± 0.11
24 DAP	0.29 ± 0.07	0.3 ± 0.04	0.28 ± 0.03	0.28 ± 0.03
Dry	0.19 ± 0.02	0.24 ± 0.02	0.15 ± 0.01	0.25 ± 0.01

Table S3. Percentage of 3C, 6C, 12C and 24C nuclei at a given DAP and in dry seeds in endosperm **Supports Figure 4a.** Values are the means from 3 biological replicates, each with at least 5 measurements (seeds) ± SD. Blue color = mesic; green color = semi-mesic; green-brown color = semi-xeric; orange color = xeric.

4 DAP

	HS584	THm	ZFm	RPm	NOm	BGsm	NOsx	MHx	MGx	WQx
3C	58.9 ±7.36	60 ±6.66	62.4 ±8.92	62.6 ±4.73	51 ±13.62	59.1 ±1.25	59.3 ±6.22	50.5 ±1.36	80.2 ±2.12	66.6 ±1.87
6C	32.5 ±6.96	32 ±7.01	30.4 ±9.12	29.6 ±6.05	39.4 ±14.71	31.5 ±1.61	33.1 ±6.04	40 ±3.74	14.3 ±1.21	27.2 ±1.94
12C	6.7 ±0.86	6.4 ±0.3	5.6 ±1.05	6.1 ±1.97	7.4 ±0.42	7.4 ±1.97	5.9 ±0.54	7 ±2.41	3.9 ±0.64	4.8 ±0.62
24C	1.8 ±0.19	1.4 ±0.33	1.6 ±0.46	1.6 ±0.94	2.1 ±0.6	1.9 ±0.84	1.7 ±0.15	2.4 ±0.72	1.4 ±0.22	1.2 ±0.07

6 DAP

	HS584	THm	ZFm	RPm	NOm	BGsm	NOsx	MHx	MGx	WQx
3C	50.9 ±4.4	59.7 ±3.1	55.3 ±9.61	55.5 ±7.19	56.1 ±6.98	53.4 ±0.61	61.6 ±6.59	50.2 ±5.67	75.3 ±3.1	56.9 ±1.12
6C	34 ±3.47	34.1 ±1.58	35.6 ±6.87	33.7 ±0.93	30.2 ±2.91	36.1 ±1.7	31.7 ±6.31	40.4 ±4.69	19.8 ±3.25	35.1 ±0.91
12C	12.7 ±6.18	5 ±1.08	7.1 ±2.18	8.8 ±5.87	10.2 ±6.14	9 ±1.67	5.4 ±0.95	7.6 ±1.2	3.9 ±0.32	6.6 ±1.33
24C	2.4 ±1.71	1.1 ±0.45	1.9 ±0.73	1.9 ±0.82	3.3 ±3.29	1.5 ±0.45	1.1 ±0.02	1.6 ±0.33	1 ±0.21	1.3 ±0.10

8 DAP

	HS584	THm	ZFm	RPm	NOm	BGsm	NOsx	MHx	MGx	WQx
3C	48.3 ±1.35	54.9 ±2.7	49.8 ±9.33	47.9 ±3.15	56.2 ±6.73	39.6 ±1.55	52.2 ±3.93	44.5 ±3.35	47 ±2.17	61.2 ±1.19
6C	27.5 ±3.79	35.2 ±2.32	32.2 ±1.79	34.5 ±3.82	29.8 ±2.82	30.3 ±1.83	30 ±3.09	30.5 ±0.73	32.8 ±1.38	33.2 ±1.5
12C	18.4 ±0.45	8.1 ±0.69	14.1 ±6.61	15.1 ±0.2	10 ±3.09	23 ±1.1	14.7 ±3.08	17.9 ±2.11	17.1 ±2.09	4.6 ±0.7
24C	5.8 ±2.12	1.7 ±0.53	3.9 ±3.49	2.3 ±0.5	2.9 ±1.9	7 ±0.96	3.1 ±3.79	7 ±1.08	3 ±0.48	0.9 ±0.2

12 DAP

	HS584	THm	ZFm	RPm	NOm	BGsm	NOsx	MHx	MGx	WQx
3C	27.1 ±5.35	33.2 ±7.78	35.8 ±6.77	44.4 ±4.04	35.8 ±0.82	37.4 ±7.42	33.4 ±2.99	22 ±4.27	40.5 ±10.28	26.5 ±6.08
6C	34.3 ±2.63	34.5 ±1.69	32.3 ±0.99	32 ±1.79	31.1 ±0.94	29.9 ±0.36	31 ±1.19	30.3 ±0.76	31.4 ±3.61	39.4 ±1.62
12C	26.4 ±3.4	24.3 ±4.63	22.2 ±3.28	19 ±2.11	24.3 ±1.21	21.1 ±4.64	25.2 ±1.38	29.1 ±0.79	21.3 ±5.9	28.6 ±3.76
24C	11.9 ±0.55	7.9 ±1.51	9.5 ±3.92	4.5 ±1.98	8.7 ±0.49	11.2 ±2.57	10.3 ±0.71	18.3 ±4.08	6.6 ±1.22	5.4 ±0.79

16 DAP

	HS584	THm	ZFm	RPm	NOm	BGsm	NOsx	MHx	MGx	WQx
3C	25.7 ±1.98	35 ±15.36	18.4 ±1.84	22.9 ±1.69	27.1 ±1.89	22.5 ±5.45	28.8 ±2.09	21.1 ±2.3	17.4 ±2.77	30.9 ±12.86
6C	34.1 ±0.65	33.5 ±3.36	33.2 ±3.11	42.5 ±1.46	30.9 ±1.56	32.1 ±1.31	30.1 ±4.78	25.2 ±2.83	37.3 ±1.06	36.6 ±1.9
12C	29.1 ±1.58	23.3 ±8.89	34.4 ±1.76	28.4 ±1.38	29.8 ±0.22	32.9 ±3.56	28 ±4.29	29.6 ±0.79	29.8 ±1.83	26.1 ±7.69
24C	10.8 ±2.74	7.7 ±4.07	13.6 ±2.77	6.2 ±1.57	11.8 ±0.51	12.3 ±0.61	12.9 ±6.16	23.5 ±5.29	15 ±1.98	6.3 ±3.33

20 DAP

	HS584	THm	ZFm	RPm	NOm	BGsm	NOsx	MHx	MGx	WQx
3C	29 ±3.01	27.8 ±2.04	21.4 ±2.05	22.7 ±3.27	26.8 ±3.3	24.1 ±1	26.6 ±2.94	24.2 ±3.17	21.4 ±2.54	17.6 ±1.29
6C	37.6 ±2.43	36.1 ±0.67	33.7 ±0.94	38.7 ±0.42	29.4 ±2.13	30.4 ±1.78	32.7 ±1.3	31 ±1.64	32 ±0.64	31.2 ±2.66
12C	25.5 ±1.6	26.3 ±2.67	30.9 ±1	31 ±2.39	32.2 ±2.36	31.9 ±0.17	30.7 ±2.39	26.9 ±7.75	33.9 ±2.28	36.6 ±1.9
24C	7.7 ±1.03	9.5 ±1.55	13.4 ±1.46	7.5 ±1.5	11.4 ±1.13	13.2 ±2.95	9.9 ±3.26	17.7 ±3.01	12.3 ±0.89	14.1 ±2.19

24 DAP

	HS584	THm	ZFm	RPm	NOm	BGsm	NOsx	MHx	MGx	WQx
3C	26.2 ±0.58	26.9 ±1.4	25.7 ±3.01	22.7 ±1.53	28.2 ±2.34	22.8 ±2.1	30.1 ±2.19	31.9 ±2.54	20 ±2.04	23.8 ±2.11
6C	34.2 ±0.71	33.8 ±1.8	29.1 ±2.47	38 ±3.95	29.4 ±2.79	30.7 ±1.82	30.8 ±2.65	33 ±0.28	32 ±1.82	35.2 ±3.26
12C	29.1 ±0.98	31.2 ±1.12	28.9 ±1.74	31.8 ±2.43	30.7 ±1.87	32.7 ±1.65	28.7 ±2.55	23 ±5.92	34.6 ±0.46	31 ±2.2
24C	10.5 ±0.9	8 ±1.61	15.8 ±2.84	7.4 ±3.42	11.6 ±1.72	13.6 ±1.43	10.3 ±0.78	11.8 ±3.46	13.1 ±4.03	9.7 ±3.22

Dry

	HS584	THm	ZFm	RPm	NOm	BGsm	NOsx	MHx	MGx	WQx
3C	31.1 ±1.13	37.2 ±2.29	38.7 ±1.81	39.5 ±1.31	46.8 ±1.38	38.1 ±2.27	44.9 ±1.53	28.9 ±3.77	38.2 ±2.25	37 ±1.37
6C	51.8 ±2.33	47.2 ±2.5	41.2 ±1.7	45.8 ±3.2	39.5 ±2.09	39.5 ±4.21	36.8 ±2.36	57 ±2.08	44.9 ±1.03	46.5 ±1.96
12C	12.5 ±0.82	12 ±0.24	15.1 ±0.88	11.3 ±1.46	10.5 ±0.29	15.5 ±2.27	13.4 ±1.64	11.4 ±1.35	12.7 ±3.26	12.3 ±0.81
24C	4.2 ±1.65	3.5 ±0.2	4.8 ±0.51	3.3 ±0.46	3.1 ±0.52	6.6 ±0.4	4.5 ±0.53	2.6 ±0.49	4.1 ±3.07	4 ±0.15

Table S4. Super cycle values at a given DAP calculated for endosperm. **Supports Figure 4b.** Values are the means from 3 biological replicates, each with at least 5 measurements (seeds) ± SD.

	HS584	THm	ZFm	RPm	NOm	BGsm	NOsx	MHx	MGx	WQx
4 DAP	0.16 ± 0.04	0.1 ± 0.01	0.09 ± 0.02	0.09 ± 0.04	0.12 ± 0.02	0.12 ± 0.04	0.09 ± 0.04	0.11 ± 0.01	0.07 ± 0.01	0.08 ± 0.01
6 DAP	0.11 ± 0.01	0.07 ± 0.02	0.11 ± 0.03	0.13 ± 0.07	0.1 ± 0	0.12 ± 0.01	0.08 ± 0.03	0.11 ± 0.01	0.06 ± 0.01	0.1 ± 0.01
8 DAP	0.18 ± 0.08	0.12 ± 0.01	0.22 ± 0.11	0.2 ± 0.01	0.19 ± 0.1	0.38 ± 0.04	0.2 ± 0.02	0.32 ± 0.11	0.23 ± 0.03	0.07 ± 0.01
12 DAP	0.3 ± 0.04	0.4 ± 0.08	0.42 ± 0.11	0.28 ± 0.06	0.42 ± 0.02	0.45 ± 0.08	0.46 ± 0.1	0.67 ± 0.02	0.35 ± 0.08	0.4 ± 0.05
16 DAP	0.53 ± 0.05	0.5 ± 0.03	0.63 ± 0.07	0.41 ± 0.03	0.55 ± 0.01	0.58 ± 0.1	0.54 ± 0.05	0.78 ± 0.1	0.61 ± 0.04	0.47 ± 0.02
20 DAP	0.42 ± 0.02	0.46 ± 0.03	0.59 ± 0.04	0.47 ± 0.05	0.55 ± 0.04	0.6 ± 0.02	0.51 ± 0.06	0.63 ± 0.06	0.6 ± 0.03	0.66 ± 0.04
24 DAP	0.5 ± 0.01	0.48 ± 0.03	0.62 ± 0.07	0.47 ± 0.09	0.54 ± 0.03	0.6 ± 0.02	0.5 ± 0.04	0.47 ± 0.01	0.61 ± 0.08	0.51 ± 0.05
Dry	0.22 ± 0.04	0.19 ± 0	0.18 ± 0.02	0.18 ± 0.02	0.17 ± 0.01	0.3 ± 0.02	0.19 ± 0.02	0.17 ± 0.03	0.22 ± 0.04	0.21 ± 0

	mesic	semi-mesic	semi-xeric	xeric
4 DAP	0.1 ± 0.01	0.12 ± 0.01	0.09 ± 0.01	0.09 ± 0.02
6 DAP	0.1 ± 0.02	0.12 ± 0.01	0.08 ± 0.01	0.09 ± 0.03
8 DAP	0.18 ± 0.04	0.38 ± 0.02	0.2 ± 0.01	0.21 ± 0.13
12 DAP	0.38 ± 0.07	0.45 ± 0.03	0.46 ± 0.03	0.47 ± 0.17
16 DAP	0.52 ± 0.09	0.58 ± 0.03	0.54 ± 0.07	0.62 ± 0.15
20 DAP	0.52 ± 0.06	0.6 ± 0.03	0.51 ± 0.01	0.63 ± 0.03
24 DAP	0.53 ± 0.07	0.6 ± 0.04	0.5 ± 0.03	0.53 ± 0.07
Dry	0.18 ± 0.01	0.3 ± 0.02	0.19 ± 0.01	0.2 ± 0.03

Table S5. Super cycle values at a given DAP calculated for embryo/seed maternal tissues (EMB+SMTs) and endosperm (END). Data are the means (±SD) from three biological replicates, each with at least 5 individual measurements. **Supports Figure 5a**.

EMB + SMTs	Wild	Cultivated
4 DAP	0.07 ± 0.01	0.11 ± 0.03
6 DAP	0.12 ± 0.03	0.2 ± 0.04

END	Wild	Cultivated
4 DAP	0.1 ± 0.02	0.11 ± 0.02
6 DAP	0.1 ± 0.02	0.14 ± 0.05

8 DAP	0.21 ± 0.06	0.29 ± 0.05	8 DAP	0.21 ± 0.09	0.26 ± 0.08
12 DAP	0.33 ± 0.05	0.32 ± 0.06	12 DAP	0.41 ± 0.11	0.39 ± 0.11
16 DAP	0.29 ± 0.06	0.26 ± 0.04	16 DAP	0.56 ± 0.1	0.46 ± 0.13
20 DAP	0.27 ± 0.08	0.21 ± 0.04	20 DAP	0.55 ± 0.08	0.43 ± 0.1
24 DAP	0.28 ± 0.04	0.18 ± 0.03	24 DAP	0.53 ± 0.06	0.36 ± 0.07
Dry	0.22 ± 0.04	0.17 ± 0.03	Dry	0.2 ± 0.04	0.19 ± 0.02