Temperature During Seed Development Affects Size, Germinability and Storability of Lettuce Seeds.

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Among the factors affecting seed quality are the environmental conditions under which the seeds are produced. The objective of this study was to determine how temperature of the mother plant environment affects lettuce seed quality. Seeds of cv. Tango were produced in growth chambers under one of two treatments: i) high temperature (HT), with day/night temperatures of 30/20°C, respectively, and ii) low temperature (LT), with temperatures of 20/10°C. In both cases the day-length (fluorescent light) was 12 h. Seeds produced at LT were 25% heavier than seed from HT, however germination at optimal conditions (20°C-light) was similar for both treatments. Seeds from HT presented better dark germination at 18, 24 and 29°C. Germinability (% and rates) under light at temperatures between 20 and 33°C was similar for seeds from both treatments, however at temperatures between 33 and 40°C seeds from HT performed better than those from LT. When germinated at negative osmotic potentials, germinability of seed from HT was less affected than LT. After accelerated aging (41°C, ~100%RH, 72 h) germination of normal seedlings was higher for seeds from HT. Germination after 1, 2 and 3 months of storage at 30°C and 74% RH was better for seeds from HT. The critical moment for temperature effects was also studied. Seed weight, dark germination at 30°C and germination at low osmotic potential showed to be determined earlier during seed development (before 5 and 4 days after flowering for seeds from LT and HT, respectively). On the other hand, seed storability was determined at the end of seed development, after physiological maturity (~15 and 10 days after flowering for LT and HT seeds, respectively). Possible mechanisms involved in these effects will be discussed.