

Light and temperature interactions in promoting lettuce seed germination

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Lettuce seeds (*Lactuca sativa* var. *acephala* cv. 'Tango') were used with the objective of determining the effect of temperature, light and their interactions in promoting germination. Under standard optimal conditions (20°C, constant light) the seed presented 100% germination (radicle emergence 5 days after sowing). Different treatments evaluated germination under dark conditions, with or without a light break (red light, 28.8 mmol·m⁻²) 48 h after sowing, and with different combination of temperatures pre (soaking temperature, ST) and post (germination temperature, GT) the light break (LB). Germination at constant 20°C without LB was less than 5%, and with LB it was around 30%. However, germination was close to 100% at GT of 20°C when LB was applied after a ST of 10°C, and around 50% under the same conditions but without LB. When GT was 30°C and LB was applied, germination was less than 3% with ST= 30°C, less than 10% with ST=20°C, and around 100% when ST=10°C. With ST and GT of 10°C and 30°C, respectively, and no LB, germination was less than 5%. Germination at 10°C constant, with and without LB was around 90% and 0% respectively. When ST was 40°C and LB was applied, germination was around 40% at GT= 20°C, but less than 3% with GT= 30°C. In summary, a severe inhibition of germination was observed when seeds were germinated in dark, which was partially reversed by either a light treatment or soaking at 10°C, and fully reversed when both treatments were applied together. Inhibition of lettuce germination at 30°C was observed when this temperature was applied after a light treatment, but not when applied before. Possible implications of these germination results for the phytochrome mechanism of action are discussed.