

A review of heat stress in canola (*Brassica napus* L.)

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With growing importance of canola (*Brassica napus* L.) as a global oil crop, its production increasingly expands beyond temperate regions into warmer climatic zones. Additionally, climate change leads to rising temperatures and a higher risk of heat stress induced crop losses throughout the world. Against this background, we review the status-quo of agronomic research on heat stress in canola. We first evaluate the reported evidence of heat stress induced canola crop losses around the globe. We furthermore review the range of experimental approaches applied in heat stress research in canola, which span from meta-analysis of historic multi-environment trials, and field experiments with sequential sow-

ing, to experiments with induced heat stress in controlled environments. For the latter the largest body of literature exists with heat stress treatments mainly applied during flowering and seed filling stage. The actual effects of different intensities and durations of heat stress treatments are largely investigated via morphological and physiological parameters while most studies determine heat stress effects on yield quantity and quality as well as yield components. Finally, we examine various prospects of alleviating heat stress in canola including genetic and agronomic approaches; we identify existing knowledge gaps and highlight related research demand.