

## **Transgenerational effects of heat and drought stress in oilseed rape (*Brassica napus* L.)**

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Oilseed rape (*Brassica napus* L.) is a major global oil crop grown mainly under temperate climatic conditions. With increasing global edible oil demand and improving genetic yield, its production further expands to warmer climatic zones. Additionally, climate change leads to increasing heat and drought stress, which are limiting factors to plant growth, development, and productivity, which lead to impeding agronomic and economic performance, and seeds germination, as a primary stage of plant development, can be affected strongly by the abiotic stress that occurs during mother plant growth and development. A pot experiment was conducted in the experimental facilities at Julius Kühn Institute in Kleinmachnow. The study investigates the single and combined effects of heat and drought stress on crop morphology, physiology, and yield formation under the timing and intensity of stress. Hence, four factors are tested in combination: heat stress at four levels and drought stress, treatment timing, and treatment duration with two groups each. Harvested seeds were planted on Petri dishes under controlled conditions in climate chambers, under 23°C; seeds were irrigated at the beginning of the experiment. Germinated seeds were accounted for every 2 hours from 12 hours of planting until 40 hours after planting.

We find that all experiment factors exerted significant effects on germinated percent, with increasing heat and drought stress as well as longer duration leading to changes in germination rate. We further find that seeds showed more response under drought stress. We find that both heat and drought affected germination at different branch levels.