**Recuperating from stress – How does sunflower recover from drought?**

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**Abstract:** Climate change profoundly affects crop production. Under field conditions, there is a cycle of rainfall and rainless periods. The intervals between rainfalls have become prolonged in certain growing areas due to climate change leading to a significant reduction in crop production. The ability to recover from drought periods depends on the species, genotype, and the duration and severity of drought stress. As sunflowers are particularly sensitive to drought at the germination stage, our goal was to develop a test for examining the capacity of sunflower to recover from stress in the initial developmental stage. The test was set up in rhizotrons, to monitor root growth in controlled conditions. After 7 days of stress, plants were re-watered to reach the control's gravimetric water content (65% qwc). Re-watering in rhizotrons can be challenging due to the surface depth ratio hampering the homogeneous distribution of water added. We have thus introduced a novel recovery option by slow re-watering, facilitating a more homogeneous increase of soil water content throughout the rhizotron. For developing this test, we have chosen a drought-sensitive sunflower line which we first exposed to drought conditions (50% gwc) and then added water to observe the recovery capacity. Root and shoot traits between control and treatment were analysed, such as total, primary and lateral root length, root system with and depth, leaf area, and fresh and dry shoot weight. This test will enable obtaining more information on how sunflowers recover from stress which will be very helpful in breeding programs.

**Key words:** *Helianthus annuus* L., drought, re-watering, root phenotyping, rhizotrons

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