

**Comparative studies of the effects of reduced water availability and salinity stress on the germination of six soybean cultivars**

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The effect of reduced water availability using polyethylene glycol (PEG) 4000 solutions and of sodium chloride (NaCl) on the germination of six soybean cultivars (Williams, Hobbit, Century84, Sahar, Simess, and Century232) was studied for 8d at 22 °C in the dark using a range of PEG 4000 and NaCl concentrations that gave the solution water potentials i.e. 0 to -1.9 MPa, 0 - 30% PEG, 0 - 421.1 mMolal NaCl. After 8d the ungerminated seeds were transferred to 0 MPa (distilled water) for 7d. Cultivars differed both in their response to reduced water availability and salinity and in their ability to recover from stress period and individual cultivars also differed in tolerance to the two stresses. Williams and Simess were tolerant and Century232 and Hobbit were sensitive to reduced water availability in PEG. However, at the same water potential Century232, along with Williams, and Hobbit were tolerant of high salinity whereas Simess, Hobbit, Century84 were sensitive. At any water potential germination in PEG was reduced more than in NaCl, although most seeds were able to germinate when water was available in a recovery period. In contrast the failure to recover from exposure to high salinity indicated toxic effects of NaCl. In the same water potential, differences of germination in PEG and saline conditions may be due to the inability of the PEG molecule to enter the seed, in contrast with the uptake of NaCl which affected seed water potential and imbibition and in some cases causes toxicity.