

## 106 - DETERMINATION OF SOYBEAN SEED OSMOTIC POTENTIAL PRIOR TO GERMINATION UNDER STRESS CONDITIONS

KHAJEH-HOSSEINI<sup>1</sup>, MOHAMMAD, POWELL<sup>1</sup>, ALISON A. & BINGHAM<sup>2</sup>, IAN

<sup>1</sup>Department of Agriculture & Forestry, University of Aberdeen, Hilton Campus, Hilton Place, Aberdeen, AB24 4FA, Scotland, U.K

<sup>2</sup>SAC, Department of Agronomy, Craibstone Estate, Aberdeen, AB21 9YA, Scotland, U.K

Measurement of the osmotic potential of seeds by thermocouple psychrometry is not suitable for use with seeds that have been subjected to stress during germination using PEG and NaCl, due to errors arise from contamination of cell sap by PEG and NaCl in the apoplastic water. The osmotic potential of soybean seeds was therefore assessed by a modified form of a moisture release (MR) curve. Soybean seeds (cv. Williams) were imbibed either in deionised water or 421 mM (-1.9MPa) NaCl solution then dehydrated to a constant relative water content (RWC) by placing them in PEG solutions at a range of water potentials from -0.5 to -6.5 MPa. Seeds were also imbibed directly in a range of PEG (-0.5 to -6.5 MPa) solutions until they reached an equilibrium moisture content (MC) and the seed RWC calculated on the basis of a MC of 55% at full imbibition. The inverse of external water potential ( $1/\psi$ ) at MC equilibrium was then plotted against the seed RWC, that is, as a MR curve which was used to determine seed osmotic potentials. At lower external water potentials of PEG solutions the seed osmotic potential was lower (i.e. more negative) in all cases. A lower osmotic potential at full turgor (RWC=100%) (-2.15 MPa) was observed for the seed pre-treated with NaCl compared with seed placed directly in PEG solutions (-1.79 MPa). MR curves give tissue-average values for osmotic potential, while the MC for the components of soybean at full imbibition are different. Therefore, the applicability of the MR technique may depend on the seed structure and the nature of seed water relations in different species particularly in stress conditions.