THE EFFECTS OF SALINITY ON THE GERMINATION AND EARLY SEEDLING GROWTH OF SOYBEAN

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The effect of salinity (NaCl) on the germination and seedling growth of soybean (cv. Williams) was studied using a range of NaCl concentrations (0-500 mMolar NaCl). Germination was counted after 6 days and seedling growth rate was measured 3-4 days after germination. The concentrations of Na, K and Ca in the embryonic axis in pre and post-germination stages were determined by Flame Photometer and Atomic Absorption Spectrophotometry. Germination and early seedling growth differed in their response to salinity. In all salinities except 500 mMolar NaCl, the seeds germinated, but seedlings grew little at concentrations above 160 mMolar. Seedling growth was completely inhibited at a tissue Na concentration of 6 mg g⁻¹ and yet germination was possible at tissue concentrations of 9 mg g⁻¹ where a germination of over 70% was achieved. One possible explanation for the ability to germinate at the higher Na tissue concentration may be the presence of higher concentrations of K and Ca in the tissue in the pre-germination phase and therefore a low Na : K+Ca ratio. The presence of these salts may protect cell membranes against the toxic effects of Na.