

# Theoretical Effects of Altered Biological and Chemical Properties on Salinity Tolerance of *Acacia* seeds

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## Abstract

Multiple regression equations (Rehman *et al.* 2000) have been developed to predict the salinity tolerance of *Acacia* seeds, expressed as the  $I_{50}$  (the concentration of NaCl required to reduce final germination to 50% of the control value in DW). Accurate predictions can be made using one or more chemical and biological seed parameters. In this study the theoretical effect of varying final germination percentage in distilled water, germination rate in distilled water (Rate),  $Ca^{2+}$  or  $K^+$  contents and their ratios, as independent factors or related factors, on the predicted salinity tolerance ( $I_{50}$ ) of *Acacia* species was investigated. Simulation of the effects of changing final germination, rate, calcium and potassium suggest the possibility of practical application of these results to modify the salinity tolerance of seeds. The predicted  $I_{50}$  increased with increasing final germination. Similarly, the higher the rate of germination, the higher the predicted salt tolerance of *Acacia* species. The  $Ca^{2+}$  content of seeds was found to be positively correlated with  $I_{50}$ . Species with higher  $Ca^{2+}$  contents had a higher  $I_{50}$ . This suggests that  $I_{50}$  might be increased by increasing the  $Ca^{2+}$  contents of seeds by pretreatment with calcium salts or by supplying these to the mother plants.

**Key words** : *Acacia* species, salinity tolerance, seed germination, calcium, potassium