

Title: Effects of seed priming and water potential on germination of cotton (*Gossypium hirsutum* L.) and maize (*Zea mays* L.) in laboratory assays

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Abstract

Sub-optimal crop emergence and establishment is a problem in crop production owing to low soil moisture. The effects of seed priming (seed soaking) on cotton and maize germination at different water potentials (0, -10 kPa, -100kPa, -200 kPa, -500 kPa and -1500 kPa) were determined in laboratory experiments. The interaction of these treatments with cultivar was studied in cotton (CY889 and SZ93-14), and with seed size in maize (small, medium and large seeds of CG4141). Germination of cotton decreased progressively as water potential was lowered, but non-primed cotton seed was more sensitive to moisture stress than primed cotton seed. For maize, there was significant ($P < 0.01$) water potential \times seed size and water potential \times seed treatment interaction. Smaller seeds were less sensitive to low water potential than large and medium seeds with respect to germination, but they may have less food reserves to emerge from deteriorating seedbeds. Final germination percent of cotton and maize seed decreased as the water potential was lowered, but non-primed seed was much more sensitive to moisture stress than primed seed.