

EFFECTS OF ANTITRANSPIRANTS ON COCONUT SEEDLINGS UNDER MOISTURE STRESS

W.A.P.D.S.P. Nissanka¹, T.H. Chandrathilake² and W.M.R.S.K. Warnasooriya¹

¹*Department of Plant Sciences, Faculty of Agriculture, Rajarata University of Sri Lanka, Anuradhapura, Sri Lanka.*

²*Plant Physiology Division, Coconut Research Institute of Sri Lanka, Lunuwila, Sri Lanka.*

Drought poses a significant challenge to the survival of coconut. It causes 25–30% of seedling mortality during dry periods. Antitranspirants alleviate water stress by reducing transpiration and improving plant water status. The present study evaluated the effectiveness of antitranspirants in mitigating drought stress in coconut seedlings. A two-factor factorial experiment was conducted with two antitranspirants: CaCO₃ and Kaolin, applied at three concentrations: 3%, 5%, and 7%. Treatments were arranged in a completely randomized design with five replicates. Seven-month-old coconut seedlings of variety CRIC 60, potted in poly bags, were maintained under an open-sided rain-sheltered plant house at Coconut Research Institute. They were subjected to three moisture levels: field capacity (FC), 50%, and 25% of FC. Physiological parameters were recorded fortnightly. Data were analysed by ANOVA using Minitab software at three moisture levels. At FC, a significant difference was not observed for tested parameters among treatments and control. At 50% of FC, transpiration was significantly reduced ($p < 0.05$) in seedlings treated with 7% and 5% of kaolin and 7% and 5% of CaCO₃ with mean values of 0.15, 0.20, 0.17, and 0.28 kg m⁻² respectively, compared to control (0.36 kg m⁻²). At 25% of FC, significant ($p < 0.05$) differences were observed in transpiration and relative water content compared to the control. Transpiration was significantly reduced in seedlings treated with 7% and 5% of CaCO₃ and 7% and 5% of kaolin, with mean values of 0.082, 0.085, 0.082, and 0.085 kg m⁻² respectively, while the control recorded 0.14 kg m⁻². Relative water content was significantly higher in seedlings treated with 7% CaCO₃ and 7% and 5% kaolin, with mean values of 84.16, 83.28, and 82.26% respectively, compared to the control (69.46%). In conclusion, the application of antitranspirants effectively mitigates the adverse effects of drought on coconut seedlings. Testing of antitranspirants under field conditions is suggested for a better conclusion.

Keywords: Calcium carbonate, Drought, Kaolin, Relative water content, Transpiration