Effect of Anti-transpirant in Sustaining Rubber Leaf Physiology Under Dry Climatic Condition

P.S.V. Rupasinghe', N.S. Withanage[1], E. Munasinghe', V.H.L. Rodrigo',
S.M.M. Iqba1[2], H.A.S.L. Jayasinghe'
'Department of Export Agriculture, Uva Wellassa University Badulla, Sri Lanka.
'Rubber Research Institute of Sri Lanka, Agalawaththa.

Protocols have been developed to expand the rubber *(Hevea brasiliensis)* cultivation to Dry and Intermediate Zones of Sri Lanka, where moisture stress is the major climatic constraint. Suitable adaptation techniques are still to be developed to endorse rubber cultivation under such sub-optimal conditions. In this context, introduction of anti-transpirant has been renowned as an agro-management practice to resist crops with drought conditions. Therefore, present study was conducted to assess the benefits of anti-transpirant application in sustaining leaf physiology of rubber plant under dry climatic condition. The experiment was conducted in Padiyathalawa GN Division in Ampara district during 13th May to 22" July, 2015. The experiment was randomly arranged as two factor factorial design in three blocks. Three concentration levels (0.3 mL/L, 0.45 mL/L and 0.6 mL/L) of anti-transpirant, Green Miracle were tested against three levels of application intervals (2, 3 and 4 weeks) and thus, there were nine treatment combinations over untreated control. Environmental parameters, namely, rainfall, maximum and minimum temperatures, solar radiation, relative humidity, wind speed and soil moisture content; physiological parameters namely, stomatal conductance, chlorophyll content, photosynthesis and relative water content; growth parameters, namely, plant diameter, plant height and total leaf count of the plants were recorded over the study period. A dry period was observed during r to 22nd July, 2015 with high temperature (23 ℃ to 34 ℃), low RH (76% to 53%) and with very low rainfall. Rubber plants with the application of anti-transpirant at different concentrations and application intervals outer performed over the untreated control in terms of stomatal conductance, chlorophyll content, photosynthesis and total leaf count of the plant. Application of anti-transpirant with a concentration of 0.45 mL/L at 2 weeks interval contributed to a significant increase in stomatal conductance and chlorophyll content of leaves together with better results for photosynthesis rate, parameters of light response curve and relative water content over control. Application of anti-transpirant with a concentration of 0.6 mL/L at 2 weeks interval contributed to better results for studied growth parameters. Hence, the application of ,Green, anti-transpirant would be a better attempt to expand the rubber Cultivation to non Traditional rubber growing areas of Sri Lanka, while sustaining the leaf physioIogy of rubber plant under dry climatic condition.

Keywords: Anti-transpirent, Leaf physiological parameters, Moisture stress