

EFFECT OF ANTI-TRANSPIRANT IN SUSTAINING RUBBER LEAF PHYSIOLOGY UNDER DRY CLIMATIC CONDITIONS

A dissertation submitted to the
Faculty of Animal Science and Export Agriculture
Uva Wellassa University
In partial fulfillment of the requirement for the award of
Bachelor of Science in Palm & Latex Technology and Value Addition

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**Palm & Latex Technology and Value Addition Degree
Programme**

**Faculty of Animal Science and Export Agriculture
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2015

ABSTRACT

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 conditions. The experiment was conducted at Padiyathalawa GN Division in Ampara district during 13th May to 22nd 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 *viz*, rainfall, maximum and minimum temperatures, solar radiation, relative humidity, wind speed and soil moisture content; physiological parameters *viz*, stomatal conductance, chlorophyll content, photosynthesis and relative water content; growth parameters *viz*, plant diameter, plant height and total leaf count of the plants were recorded over the study period. A dry period could be observed during 7th to 22nd July, 2015 with high temperature, low RH and with very low rainfall. Rubber plants with the application of anti-transpirant at different concentrations and application intervals outperformed 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 for better results of studied growth parameters. Hence, the application of Green Miracle anti-transpirant would be a better attempt to expand the rubber cultivation to non-traditional rubber growing areas in the Eastern Province of Sri Lanka, while sustaining the leaf physiology of rubber plant under dry climatic conditions.

Key words: Anti-transpirant, Dry climatic conditions, Leaf physiological parameters, Moisture stress, Rubber plants