

## EVALUATION OF HAT-TYPE RAINGUARDS FOR TAPPING PANEL PROTECTION IN RUBBER (*Hevea brasiliensis* Muell. Arg)

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Rain interference reduces the productivity of rubber plantations, particularly due to exposed tapping panels. While skirt and gutter-type rainguards were introduced to address this, their adoption in Sri Lanka remains low due to increased labor demands, annual renewal requirements, and environmental concerns such as polythene waste. Given their effectiveness, three sizes of hat-type rainguards prototypes were evaluated during the peak rainy season. Each rainguard had a galvanized iron core, covered with waterproof rexine, installed at a 30° angle at 1.8 m (6 feet) from the graft union to optimize rainwater deflection without blocking tapping. Five treatments were tested: three hat-type rainguards (12, 18, and 24 inches in radius), a conventional apron-type rain guard, and a control (no rainguard). Each treatment was replicated thrice, with 10 trees per replication in a randomized complete block design (RCBD). Measurements: weather data, rain-protected height, leak percentage, distribution of tapping days, and latex yield were recorded for 30 days. Data were analyzed with two-way ANOVA at a 0.05 significance level, and treatment comparisons were made using Duncan's Test in SAS software. The results demonstrated a significant ( $p < 0.05$ ) increase in rain protection height. The 24-inch hat-type provided the highest protection (159.2 cm), followed by the 18-inch hat-type (133.2 cm), and the 12-inch hat-type (76.0 cm). The apron-type rainguard provided only 47.8 cm of protection and required annual replacement. Both apron and hat-type recorded 0% leakage. The control group experienced a significant loss of tapping days, while all rainguards had similar tapping day distribution. In conclusion, the 24-inch hat-type rainguard offered the best tapping panel protection. Both rainguard types prevented leakage and preserved tapping efficiency, outperforming the control. Future research could focus on developing molds using UV-treated materials for enhanced durability, cost-effectiveness, and environmental sustainability.

**Keywords:** Apron type rainguard, Leak percentage, Rain interference, Tapping days