Comparative effectiveness of cardboard and plastic sheets to control the invasive exotic species *Megathyrsus maximus* in protected areas of the Paraguayan Atlantic Forest

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Abstract

Guinea grass (*Megathyrsus maximus*), an invasive exotic grass, threatens the biodiversity of the Paraguayan Atlantic Forest. This study evaluated the effectiveness of plastic and biodegradable (cardboard) covers for its control in a protected area. Three treatments were compared: cardboard cover, plastic sheeting, and a control without cover. The Kruskal–Wallis analysis showed significant differences in guinea grass cover ($H[2] = 9.601$, $p = 0.008$) and dry biomass ($H[2] = 9.414$, $p = 0.009$) among treatments. Dunn's post hoc tests indicated that both cardboard cover and plastic sheeting significantly reduced cover and biomass compared to control, with no significant differences between them. These results suggest that cardboard cover is as effective as plastic sheeting in controlling guinea grass, with the added benefit of being biodegradable and not requiring post-treatment removal. This reduces soil disturbance and facilitates passive ecosystem restoration. Long-term studies are recommended to assess the persistence of these effects and explore other biodegradable materials as sustainable alternatives for managing invasive species in protected areas.