

The Effect of Season, Fire and Slope Position on *Seriphium plumosum* L. Forage Quality in South African Grassland Communities

Authors : Hosia T. Pule, Julius T. Tjelele, Michelle J. Tedder, Dawood Hattas

Abstract : Acceptability of plant material to herbivores is influenced by, among other factors; nutrients, plant secondary metabolites and growth stage of the plants. However, the effect of these factors on *Seriphium plumosum* L. acceptability to livestock is still not clearly understood, despite its importance in managing its encroachment in grassland communities. The study used 2 x 2 x 2 factorial analysis of variance to investigate the effect of season (wet and dry), fire, slope position (top and bottom) and their interaction on *Seriphium plumosum* chemistry. We tested the hypothesis that *S. plumosum* chemistry varies temporally, spatially and pre- and post-fire treatment. *Seriphium plumosum* edible material was collected during the wet and dry season from burned and unburned areas on both top and bottom slopes before being analysed for protein (CP) content, neutral detergent fibre (NDF), total phenolics (TP) and condensed tannins (CT). Season had a significant effect on *S. plumosum* protein content, neutral detergent fibre, total phenolics and condensed tannins. Fire had a significant effect on CP. Interaction of season x fire had a significant effect on NDF and CP ($p < 0.05$). *Seriphium plumosum* in the wet season ($6.69\% \pm 0.20$ (SE)) had significantly higher CP than in the dry season ($5.22\% \pm 0.13$). NDF was significantly higher ($58.01\% \pm 0.41$) in the dry season than in the wet season ($53.17\% \pm 0.34$), while TP were significantly higher in the dry season ($14.44 \text{ mg/gDw} \pm 1.03$) than in the wet season ($11.08 \text{ mg/gDw} \pm 1.07$). CT in the wet season were significantly higher ($1.56 \text{ mg/gDw} \pm 0.13$) than in the dry season ($1 \text{ mg/gDw} \pm 0.03$). CP was significantly higher in burned ($6.31\% \pm 0.22$) than in unburned *S. plumosum* edible material ($5.60\% \pm 0.15$). *Seriphium plumosum* CP was significantly higher in wet season x burned ($7.34\% \pm 0.31$) than wet season x unburned ($6.08\% \pm 0.20$) material and dry season x burned ($5.34\% \pm 0.18$) and unburned ($5.09\% \pm 0.18$) material were similar. NDF was similar in dry season x burned ($58.31\% \pm 0.54$) and dry season x unburned ($57.69\% \pm 0.62$) material and significantly higher than similar wet season x burned ($52.43\% \pm 0.45$) and wet season x post-unburned ($53.88\% \pm 0.47$) material. This study suggests integrating fire, browsers, and supplements as encroacher *S. plumosum* control agents, especially in the wet season, following fire due to high *S. plumosum* CP content.

Keywords : acceptability, chemistry, edible material, encroachment, phenolics, tannins

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