



## Effect of canopy cover and canopy background variables on spectral profiles of savanna rangeland bush encroachment species based on selected *Acacia* species (*mellifera*, *tortilis*, *karroo*) and *Dichrostachys cinerea* at Mokopane, South Africa

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### Abstract

The proliferation of woody plant species on savanna rangelands (i.e. bush encroachment) degrades rangeland quality, thereby threatening the biodiversity conservation effort as well as pastoral farming. Hyperspectral remote sensing offers possibilities for discriminating encroaching bush species in support of management of semi-arid savanna rangelands. As a preliminary step towards establishing a spectral library of common encroaching species on savanna rangelands, the effect of canopy leaf cover, background dry soil and grass on the spectral profiles of the common encroaching species *Acacia karroo*, *Acacia mellifera*, *Acacia tortilis* and *Dichrostachys cinerea* was analysed. A sample of healthy mature plants in prime, full leaf condition was utilised at an encroached rangeland in Mokopane, South Africa. The spectral signatures were collected in-situ, using a field spectrometer pointed above the sample specimen canopies. The canopy and canopy background variables tended to modify the reflectance of the encroaching bush species in the near infrared (800e1300 nm) in which they were spectrally most separable. Canopy background dry grass tended to increase near infrared reflectance, while dry soil tended to reduce the spectral contrast among the species. These effects were reduced by high leaf content. In a thicket canopy structure, the overall reflectance tended towards the spectral profile of the more dominant species.