

## Characterising the mineral and organic composition of rangeland soils with FT-IR spectroscopy.

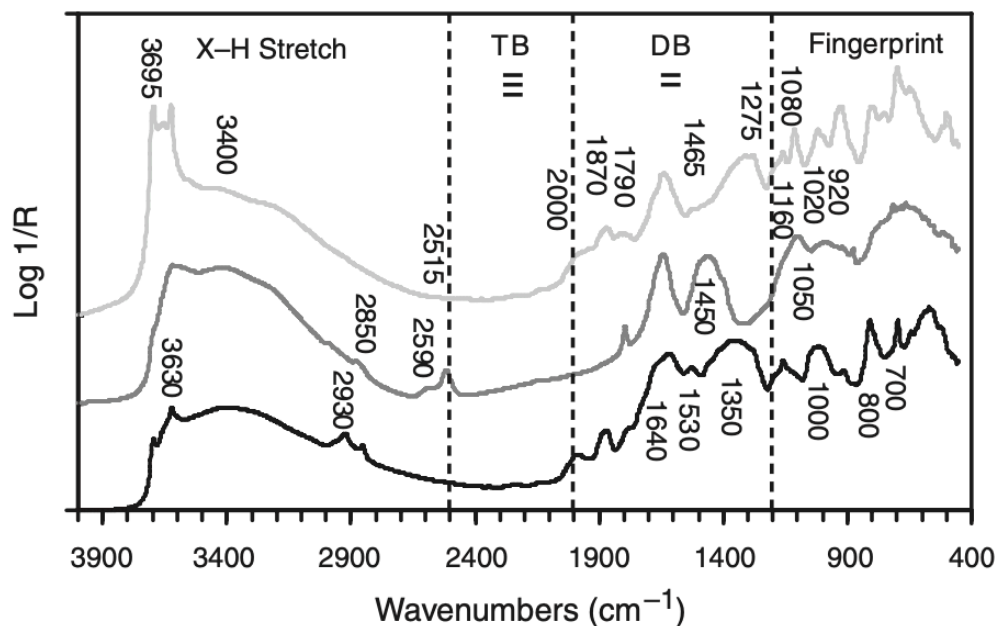
Fourier transform mid infrared (mid-IR) spectra of soil are full of information on the soil's inherent composition: its minerals and organic matter. The technique is rapid, accurate, and more economical than conventional methods of soil analysis. It does not use environmentally harmful chemicals, requires few pre-treatments, is non-destructive, and when combined with multivariate calibrations, a single spectrum can provide estimates of several soil properties. The technique is highly sensitive to both organic and inorganic soil composition, making it a potentially useful and powerful tool for the assessment and monitoring of soil, its health and function.

The project aims to develop a method for using mid-IR spectra to cost-efficiently assess soil health in dryland environments.

**Activities:** laboratory measurements of soil with a FT-IR spectrometer and statistical multivariate modelling.

**Suited to:** students who are interested in a combination of laboratory and statistical multivariate modelling.

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Soil diffuse reflectance spectra in mid infrared region between 4000–400 cm<sup>-1</sup> (or 2500–25000 nm) showing approximate occurrence of the fingerprint, double bond (DB), triple bond (TB), and X–H stretch regions and absorptions that correspond to soil minerals and organic matter.