



## Diffuse reflectance spectroscopy in soil science: current and future possibilities

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Historically, our understanding of the soil and assessment of its quality and function has been gained through routine soil chemical and physical laboratory analysis. There is a global thrust towards the development of more time- and cost-efficient methodologies for soil analysis as there is a great demand for larger amounts of good quality, inexpensive soil data to be used in environmental monitoring, modelling and precision agriculture. Diffuse reflectance spectroscopy (DRS) provides a good alternative that may be used to enhance or replace conventional methods of soil analysis, as it overcomes some of their limitations. DRS is rapid, timely, less expensive, non-destructive, straightforward and can be more accurate than conventional soil analysis. Furthermore, a single spectrum allows for predictions of various soil properties and the techniques are adaptable for use *in-situ* as proximal soil sensors. This paper will show, with examples, current applications of visible-near infrared (vis-NIR) and mid infrared (mid-IR) DRS in soil science and will describe future possible uses of DRS in soil science and land resource assessment.