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# X-ray fluorescence spectrometry for rapid screening of particle size in soils

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Soil texture is an essential factor for effective land management in agricultural production. Knowledge of soil texture and particle size at field scale can aid with on-going soil management decisions. Standard soil physical and gravimetric methods for particle size analysis are time-consuming and X-ray fluorescence spectrometry (XRF) provides a rapid and cost-effective alternative. The objective of this study was to explore the use of XRF as a predictor for particle size. An extensive archive of Irish soils with particle size and soil texture data was used to select samples for XRF analysis. Regression and correlation analyses on XRF determined results showed that the relationship between Rb and % clay varied with soil type and was dependent on the parent material. There was a strong relationship ($R > 0.62$, $R^2>0.30$, $p<0.05$) between Rb and clay for soils originating from bedrock such as limestones and slate. Contrastingly, no significant relationship ($R<0.03$, $R^2=0.00$, $p>0.05$) exists between Rb and % clay for soils originating from granite and gneiss. Furthermore, there was a significant negative correlation ($p<0.05$) between Rb and % sand. The XRF is a useful technique for rough screening of particle size distribution in soils originating from certain parent materials. Thus, this may contribute to the rapid prediction of soil texture based on knowledge of the particle size distribution.