

Agriculture

Farming starts with a proper understanding of the soil. Most farmers globally know the composition of their fields, but also look for methods that can precisely map the composition of their soils for applications as in precision farming or the selection of proper crops for their fields. This approach has been used by farmers with larger fields and using precision farming, but also by farmers that turn into biological farming. A European project on improving marginal Spanish soil showed this application. A [poster shows the results of of this EU project Crops for Better soils](#).

Various soil parameters have been mapped by using radiometrics as a proxy, some of these are based on **validated statistical models** that correlate the concentrations of the radionuclides to the parameter of interest. In these validated models, the principle why these data are correlated is understood. Depending on the mechanism, the models can be used on a regional scale, or should be determined for every site. Examples are parameters as median grain size (for sediments) and clay content. The model for mapping clay, for example, depends on geology. This model can be used for the Netherlands as a whole (which is one geological region), but models for clay that are found to be valid for Dutch soils are not necessarily valid for soils in Spain. The actual translation between radionuclides and soil properties therefore needs to be re-established again for each new, geologically different region. Others are based on **pure statistical models** try to correlate the concentrations of the radionuclides to the parameter of interest. These models are not based on a real understanding of the principle why the radionuclides are correlated to the parameter of interest, but just use a statistical correlation. This might work well for a specific site, but there is no guarantee that this approach works for all situations. These statistical models have to be proven each site that was not part of the dataset used for the statistical analysis. Examples are nutrients of soils and pollution of soil.

[SoilOptix](#) used a gamma-ray spectrometer for mapping soil properties for precision farming.

An overview of [Soil parameters measured by geophysical site investigation](#) gives an indication of parameters that have been mapped.

- [Clay content](#)
- [Cation Exchange capacity](#)