



## **The use of smartphone for determination of soil P status classes by Mehlich3 method**

Tõnis Tõnutare, Aldo Oras, and Tõnu Tõnutare

Estonian University of Life Sciences, Institute of Agricultural and Environmental Sciences, Soil Science, Tartu, Estonia  
(tonis.tonutare@gmail.com)

For determination of soil P content available for plants several extraction and instrumental analysis methods are in use today. Typically the methods of determination of plant available nutrients from soil consists of two steps – the extraction of nutrients from soil with solution of extracting reagent or reagents and analysis of nutrient content in extract

The Mehlich3 method is one of „youngest“ extraction methods for determination of soil plant available P. Due to its multielemental nature this method is quite widely used not only for agricultural but also in environmental aims. Today in Europe, the Mehlich3 method is in use as an official method in Czech Republic, Slovakia and Estonia, also Poland has commenced the procedure of implementation.

For determination of phosphorous in extracts, the molybdate blue spectrometric method and ICP method is normally used. It means, that analysis can be made only in laboratory and it makes the analysis too time consuming but for farmers in the period of plant intensive growth the time of analysis is a critical factor. Therefore the express methods of analysis is welcomed for plant growers.

Many research fields have investigated the possibility of change of spectrometers to digital cameras and provide digital image analysis instead of spectroscopic analysis. Inspired from success of such works we investigated the possibility of smartphone cameras for providing a soil P analysis directly on the field.

In our work we present the possibility of the use of smartphone for determination of soil P status classes by Mehlich 3 method.