



## PEDO-EXCEL: A SIMPLE EXCEL TOOL/DATABASE TO PREPARE AND ELABORATE SOIL PROFILE DATA

Mirko Knežević\*<sup>a</sup>, Ana Topalović<sup>a</sup>, Ljubomir Životić<sup>b</sup>

<sup>a</sup>University of Montenegro, Biotechnical Faculty, Mihaila Lalića 15, 81000 Podgorica, Montenegro

<sup>b</sup>University of Belgrade, Faculty of Agriculture, Nemanjina 6, 11080 Belgrade-Zemun, Serbia

\*Corresponding author: [mirkok@ucg.ac.me](mailto:mirkok@ucg.ac.me)

### INTRODUCTION

Soil investigations in pedology are often made of four different stages: a) preliminary stage, b) on-field soil research, c) laboratory (analytical) research and d) data elaboration. Depending on the aim of soil investigations each of these stages can last for a different amount of time. On-field soil research is the central part of soil surveys. It consists of soil profile excavation, description of soil profiles and collection of soil samples.

### MATERIALS AND METHODS

This research is based on pretested and accepted methods in scientific practice. MS office's Excel program was used to prepare the tool and FAO Guideline for soil description served as a basis.

### RESULTS

Experienced soil scientists can vast a lot of time in description of soil ectomorphological and endomorphological properties, whereas un-experienced soil scientists move often fastly over this stage to soil sampling. The description of soil profile is of the essential importance in soil surveys and a huge number of soil information can be collected while describing soil profiles.

Soil description is often done manually by filling soil forms, but it is somewhere digitized. It is also a time-consuming job how to prepare those data for the further elaborations, often how to make them digitized. Another important issue in front of the researcher is how to present a large number of soil characteristics and to elaborated data in fast and efficient manner.



Figure 1. Field work

SURFACE CHARACTERISTICS			0
Rock outcrops	Surface cover description	Very few	0
	Surface cover code	V	0
	Surface cover (%)	0-2	0
	Distance between rock outcrops (m)	20-50	1
Coarse surface fragments	Distance between rock outcrops code	2	0
	Surface cover description	Few	1
	Surface cover code	F	0
	Surface cover (%)	2-5	0
Classification of erosion category	Size classes description	Medium gravel	1
	Size classes code	M	0
	Size classes (cm)	0.6-2.0	0
	Erosion category description 1st level	Water erosion or deposition	1
Classification of area affected by eros	Erosion category code	W	0
	Erosion category description 2nd level	Deposition by water	0
	Erosion category code 2nd level	WD	0
	Area affected (%)	5-10	1
Classification of erosion by degree	Area affected code	2	0
	Description	Slight	1
	Code	S	0
	Classification of erosion by activity	Description	Active in recent past
Code		R	0
Surface sealing		Medium	1
Description_thickness		M	0
Surface cracks	Code	2-5	0
	Thickness (mm)	Slightly hard	0
	Consistence description	S	0
	Consistence code	Fine	1
Salt characteristics	Width description	F	0
	Width code	<1	0
	Distance description	Closely spaced	0
	Distance code	D	0
Surface sealing	Distance (m)	0.2-0.5	0
	Depth description	Surface	1
	Depth code	S	0
	Depth (cm)	<2	0
Salt characteristics	Cover description	None	1
	Cover code	0	0

Figure 2. Data entry form

Therefore, this necessity of being most efficient in soil data elaboration has forced us to prepare a simple Excel based tool to fastly retype and elaborate soil profile data. Pedo-Excel is based on FAO Guideline for soil description. General information, soil formation factors, and soil description headings with the different number of soil characteristics are offered to the users in drop down menues, which are specific for each soil characteristics. The user simply inserts collected data by choosing them from the menues. By this manner, the users can fill the columns for all soil horizons/layers and re-type the data for whole soil profile(s).

Soil characteristics are provided with their full names and used abbreviations. Data elaboration in Pedo-Excel starts with the simple choice which of the soil characteristics should be presented in our work, by simple choosing of "1" (yes) or "0" (no) into the column next to the characteristic. The result of this choice is an Excel table with chosen soil characteristics. Each soil sheet presents one soil profile with up to ten soil horizons/layers.

### CONCLUSION

Almost all soil characteristics presented in FAO Guideline are part of the Pedo-Excel. Pedo-Excel is a simple, user friendly, and time efficient tool for elaboration of huge series of soil profile data collected during soil surveys.