Second year of PhD in Sustainable Agricultural and Forestry Systems and Food Security

XXXVIII° CYCLE PNRR

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‘Adding hyperspectral information to better estimate soil erodibility in Campania (southern Italy)’

Dott.ssa Caterina Mazzitelli
The goal of this study is to estimate the soil erodibility (K) from soil physical and chemical properties retrieved from spectral measurements in the vis-NIR-SWIR ranges (350–2500 nm) carried out in the entire region of Campania (southern Italy), as well as in two target areas of this region.

Campania Region

Two experimental fields in Campania:
- Sele River plan
- MFC basin

Soil health indicators:
carbon stock, soil water storage, GW recharge transit time

Ecosystem services assessment:
(e.g. drought and flood effects)

Environmental tracers (stable isotopes)
Geophysical surveys
Spectral analysis
Soil physico-chemical and hydraulic properties
Integrated soil monitoring
Search for answers

Caterina Mazzitelli PhD Student - Sustainable Agricultural and Forestry systems and food security
LABORATORY MEASUREMENTS IN PORTICI AND TEL-AVIV

**Activities in Portici**
- **Grain size analysis**
  - Hydrometer method
  - % of sand, silt, and clay

- **Determination of BD**
  - Core drilling method

- **pH**
  - LLG pH-meter

- **Organic Carbon**
  - Walkley – Black method

**Activities in Tel-Aviv**

**Hyperspectral measurements**
- Spectroradiometer ASD
  - FieldSpecPRO
We used the Partial Least Square Regression to estimate Clay and Organic Carbon.

Graphs show the predicted Clay and OC on some soil samples in each data set. The prediction performance was evaluated in terms of root mean squared error (RMSE) and coefficient of determination ($R^2$). Preliminary findings indicate that our spectroscopic database provided useful information to predict soil properties which are used to compute soil erodibility.