Progress on soil analysis and laboratories related activities (GLOSOLAN updates)

Filippo Benedetti, GSP Secretariat
Nopmanee Suvannang, ITPS
Soil laboratories: where soil samples become data

19th Working Session of the Intergovernmental Technical Panel on Soils (ITPS)
13-15 November 2023 | Online meeting
GLOSOLAN: bringing soil laboratories to the forefront worldwide since 2017

Currently grouping together around 1,000 soil testing institutions from around 160 countries.
We operate at all levels...
Collaborative and participative approach...

... where the most advanced laboratories help those who need to improve
Currently 994 registered soil laboratories from 160 countries
(→ around 3,000 lab heads and technicians involved)
Harmonization of Standard Operating Procedures (SOPs)

Globally harmonized protocols, with a bottom-up, collaborative and inclusive approach.

- Include step-by-step instructions, sections on health and safety, quality assurance and control (QA/QC),
- Contribute to the replicability of an analysis and to the quality and reliability of the data,
- Available online, for free and in several languages.

New SOPs published in the last months:
- Soil respiration rate
- Soil moisture by gravimetric method
- Cation exchange capacity and exchangeable bases
- Available micronutrients by DTPA extraction method
- Quasi total elements in soil by acid digestion including heavy metals
- Bulk density

Under publication:
- Boron by hot water extraction

Under final review:
- Particulate organic carbon by physical fractionation
- Microbial biomass

Experts from the other GSP Technical Networks supported the harmonization and review of the SOPs from joint working groups.
Over 10,000 views in two years!
Capacity building

- In-person training sessions
  - Djibouti, December 2022
  - Uzbekistan, May 2023
  - Dakar, October 2023
- Webinars: new calendar in 2024
- Video training
- Review of FAO Bulletin 74
- Guidelines on reagents disposal

Several topics covered:
- SOPs implementation
- Quality control and good practices
- Health and safety
- Equipment
- Soil spectroscopy

Webinar on quality control, in Spanish, July 2022

19th Working Session of the Intergovernmental Technical Panel on Soils (ITPS)
13-15 November 2023 | Online meeting
In-person training on raising confidence in quality measurements from soil laboratories in Sub-Saharan Africa

Over 80 soil laboratory technicians from 40 Sub-Saharan countries gathered together in Dakar (Sengal) on 23-27 October 2023
Ongoing and future inter-laboratory proficiency tests (PTs)

- Launch of 3 regional PTs in 2023:
  - **Eurasia** (led by RUSOLAN, thanks to the support of PhosAgro) – Main topic: CARBON
  - **Asia** (led by the BSWM - Philippines): C, pH, N, P, K, particle size distribution
  - **Africa+NENA** (thanks to the support of BGS and IRD)

- Launch of several national PTs

- Launch of a global GLOSOLAN PT in 2024 (expectations: over 250 labs participating)

Exchange of soil samples for scientific purposes remains a major issues in many countries

- High-performing laboratories have a key role to play in helping and training less successful laboratories on a regular basis
- GLOSOLAN will continue building the capacity of countries to organize PTs and will facilitate the organization of regional/global PTs
**Primer for soil spectroscopy:** to introduce theory and concepts of soil spectroscopy at the beginner level (available in different languages)

- **Training in soil spectral modelling in R** (six sessions)

- **Webinars with spotlight on state-of-art, research and discussion**

- **Launch of the International Capacity Development Group on Soil Spectroscopy (SoilSpecNet)**

**UPCOMING TRAININGS**

- Artificial intelligence and machine learning in soil spectroscopic modelling
  - Date: 29 June 2023 | 9:00 CST
  - Speaker: Tanja van der Sande
  - Language: English
  - Details of the event: Presentation | Video recordings

**PAST TRAININGS**

- Soil spectroscopy and deep learning-based modeling for decision-making in agricultural conservation
  - Date: 18 March 2021 | 18:00 CST
  - Speaker: Prisca Attar
  - Language: English
  - Details of the event: Presentation | Video recordings

- Soil sample preparation for NIR measurement: is the grinding necessary for accurate soil predictions?
  - Date: 7 September 2022 | 18:00 CST
  - Speaker: Dr. Surbhi Bhargava
  - Language: English
  - Details of the event: Presentation | Video recordings

- Interpretation of near infrared spectra of soil: Direct use of spectra to provide new insights

**GLOSOLAN initiative on soil spectroscopy (GLOSOLAN-Spec)**

**19th Working Session of the Intergovernmental Technical Panel on Soils (ITPS)**

13-15 November 2023 | Online meeting
Joint work with other GSP Tech. Networks

• Review GLOSOLAN SOPs (biological parameters, salt-affected soils related parameters, heavy metals and pollutants)
• Develop technical documents (e.g., guidelines on reagents disposal)
• Organize together workshop and webinars
• Experts from GLOSOLAN to help other GSP Technical Networks to develop SOPs (e.g. INSOP, INSOILFER) and organize workshop together
Involvement in other GSP initiatives and programs

- RECSOIL (e.g., lab training in Togo)
- SOILCARE
- SoilFER
External collaborations

- FAO Regional Office for Asia and the Pacific: **Asian knowledge hub** - Webinar on soil labs and soil testing kits (7-8 November 2023)
- ISO: first discussion on potential cooperation held in October 2023
- GLOSOLAN invited to join the International Governance Committee (IGC) for the International Symposium on Soil and Plant Analysis (ISSPA)
- Publication on scientific journals (PT outcomes, transfer functions, etc.)
Thanks to the kind support of

AFRILAB
AFRICAN SOIL LABORATORY NETWORK

SEALNET
ASIAN SOIL LABORATORY NETWORK

EUROSOLAN
EUROPEAN AND EURASIAN SOIL LABORATORY NETWORK

NENALAB
NEAR EAST AND NORTH AFRICAN SOIL LABORATORY NETWORK

LATSOLAN
LATIN AMERICAN NETWORK OF SOIL LABORATORIES

ASPAC
PACIFIC SOIL LABORATORY NETWORK

19th Working Session of the Intergovernmental Technical Panel on Soils (ITPS)
13-15 November 2023 | Online meeting
Save the date: 7th GLOSOLAN meeting on 21-23 November

19th Working Session of the Intergovernmental Technical Panel on Soils (ITPS)
13-15 November 2023 | Online meeting

Thanks for your attention