EUROSOLAN-IV/22/Report

Food and Agriculture Organization of the United Nations

GLOBAL SOIL PARTNERSHIP

Report of the Fourth meeting of the European and Eurasian Soil Laboratory Network (EUROSOLAN)

Virtual meeting, 5 - 6 October 2022

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FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

Rome, 2022

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Introduction

The fourth meeting of the European and Eurasian Soil Laboratory Network (EUROSOLAN) was held online on 5 and 6 October 2022. The meeting was attended by about 100 laboratory staff members from thirty-seven European and Eurasia countries. The list of participants is available in Annex I.

The meeting was opened by Ms Maria Romic, EUROSOLAN Chair, Ms Nicole Wellbrock, European Soil Partnership Secretary, and Ms Gulchekhra Khasankhanova, Chair of the Eurasian Soil Partnership, who recalled the importance of good quality, harmonized data in decision making and the link between the Global Soil Laboratory Network (GLOSOLAN) and global soil mapping activities. Ms Romic fianally recalled the objectives of the meeting: (i) to inform European and Eurasian laboratories on GLOSOLAN progress and the way forward, (ii) to bring soil laboratories issues and challenges to the attention of national governments by bridging the gap between soil laboratories and national focal points to the Global Soil Partnership (GSP), (iii) to discuss the results of the GLOSOLAN proficiency test (PT) 2022, (iv) to identify the standard operating procedure for GLOSOLAN and EUROSOLAN to harmonize, and (v) to open the discussion on the interpretation of laboratory results and the provision of recommendations to farmers.

In order to meet these objectives, national focal points to the GSP were invited to attend the first day of the meeting (see agenda in Annex II).

Highlights and conclusions

Ms Lucrezia Caon (GLOSOLAN coordinator) opened the meeting by introducing national focal points to the GSP and new EUROSOLAN members to GLOSOLAN, recalling that uncertainty in soil data is currently too large to monitor changes in soil properties, to make scientific conclusions or to pay for ecosystem services. By improving the performance of soil laboratories and reducing uncertainty in the measurement, GLOSOLAN plays a key role in providing better soil data for better soil management and decision-making. At present, GLOSOLAN is composed of almost 1 000 member laboratories organized into Regional Soil Laboratory Networks (RESOLANs). Since 2021, GLOSOLAN supports countries in establishing their National Soil Laboratory Networks (NASOLANs).

Thereafter, the discussion focused on the following topics:

- National Soil Laboratory Networks (NASOLANs).

During the meeting, representatives from Belgium, Austria, Croatia, Georgia, Hungary, Turkey, Uzbekistan and the Russian Federation shared their experience on the establishment of their NASOLANs. Sharing experience was useful to many other laboratories that are facing issues in establishing their own national network, who benefitted by hearing successful stories from similar contexts.

The main benefits obtained from an established, well-functioning NASOLAN were identified as the implementation of several activities, according to laboratories' main needs. These include the development and harmonization of new methodologies, joining the efforts in promising scientific research, and the establishment of strong collaborations with other national, regional and global soil initiatives.

In some countries, the main obstacle in grouping all soil laboratories together is the structure of the national institutions and organizations dealing with soil. In order to tackle this issue, it was proposed to group first laboratories from the same type of institution (e.g. university, government, research centers, private sector, etc.) or dealing with the same type of soil analysis. This would also help to increase the participation of research laboratories and laboratories working on specific soil parameters in the work of EUROSOLAN and GLOSOLAN. Moreover, participants from small countries or countries with few soil laboratories proposed to establish join efforts under the same NASOLAN or sub-regional network.

Countries were invited to provide information on the status of establishment of their NASOLAN or their NASOLAN activities to the GLOSOLAN coordinators. Information will be used by the GLOSOLAN coordinators to create or update NASOLAN webpages. The GLOSOLAN coordinators also reminded participants about the Terms of Reference for NASOLANs and the guidelines on how to establish a National Soil Laboratory Network that provide stepwise instructions to develop the national networks and report about interesting study cases.

- Bridging the gap between soil laboratories and national governments

Mr Filippo Benedetti (GLOSOLAN Alternate coordinator) presented the results of the survey on the interaction between national reference laboratories and national focal points to the GSP. The survey was completed by the national reference laboratories for Albania, Belgium, Croatia, Czechia, Georgia, Iceland, Kyrgyzstan, Latvia, Netherlands, Portugal, Romania, Russian Federation and Türkiye. When asked about the type of support they receive from the government, the majority of laboratories (32 percent) answered that they receive moral support or support in terms of recognition and visibility at the national level. Twenty-six percent of respondents declared not to receive any type of support while 21 percent of them declared to have a preferential communication channel with the government. Only 11 percent of laboratories receive support either in the form of extra budget or in the form of additional staff.

The majority of laboratories (92 percent) do not receive any support from sponsors or donors other than the government. Still, the majority of laboratories that answered the survey (nine) are the main and unique data providers to their government for national soil assessment and mapping activities. Two laboratories declared to act as main data providers for their government together with other institutions, one provides data to other organizations following the signature of a written agreement and the remaining two laboratories declared not to be involve in national soil assessment and mapping activities at all.

During the discussion, national focal points to the GSP pointed out that:

- It is difficult to involve all governmental laboratories in a country because they operate under different ministries.
- Problems arise when the focal point is not from the same ministry as the national reference laboratory.
- GLOSOLAN and especially EUROSOLAN are not known within the ministries so that it is difficult to mobilize the government in support of the laboratories.

The proposal to prepare a flyer/brochure on EUROSOLAN and to translate it into local languages was made. GLOSOLAN will work with EUROSOLAN to prepare:

- One flyer/brochure for soil laboratories: this should stress the added-value of GLOSOLAN/EUROSOLAN in building the capacity of its member laboratories. Therefore, it should focus on equipment, standard operating procedures and the fact that joining the network will give international visibility to member laboratories (e.g. through the GLOSOLAN/FAO website).
- One flyer/brochure for the government: this should focus on data quality for decision-making and the role of GLOSOLAN in supporting countries on the reporting on the Sustainable Development Goals.

- EUROSOLAN performance in the GLOSOLAN PT 2022

On behalf of Mr Christian Hartmann (IRD, France), Mr Filippo Benedetti presented an overview of the performance of the EUROSOLAN members that participated to the GLOSOLAN Proficiency Test (PT) 2022. Forty-nine soil laboratories from 26 European and Eurasian countries received a parcel containing a set of ten soil samples. Each sample contained 10 g of homogenized soil material that had been dried, sterilized and packed in double-layers plastic bags. Each sample was labelled in progression using the suffix "GLO-" (i.e. GLO-1, GLO-2, etc.). Laboratories were asked to determine a few basic chemical parameters for each sample, namely: soil carbon, total nitrogen and soil available phosphorus. While total nitrogen and available phosphorus were not mandatory parameters to analyze, PT participants were asked to deliver results on carbon as a mandatory condition to join the PT. This condition was decided due to the global need to have precise data on the organic carbon content of the soil, given its role in fighting climate change.

The PT instructions delivered to each participant specified that the Standard Operating Procedures (SOPs) harmonized by GLOSOLAN should have been used to analyze each soil parameter. These were:

SOPs on carbon:

- Total carbon by Dumas dry combustion method available in English, Spanish and Russian (EN | ES | RU);
- Organic carbon by Walkley and Black method – titration and colorimetric method available in English, Spanish and Russian (EN | ES | RU);
- Organic matter by loss of ignition. Please note that GLOSOLAN does not have a SOP for measuring organic matter by loss of ignition at 450-550 °C yet.

SOPs on phosphorus:

- Soil available phosphorus by Olsen method available in English only (EN);
- Soil available phosphorus by Bray I method available in English only (EN);
- Soil available phosphorus by Bray II method available in English only (EN).

SOPs on nitrogen:

- Soil total nitrogen by Dumas dry combustion method available in English only (EN);
- Soil total nitrogen by Kjeldahl method available in English only (EN).

The low amount of soil needed to carry out the analysis using the methodologies reported above allowed participants to perform more than one procedure for the same parameter.

Each laboratory was provided with a unique pin code to be used to upload the analysis results on an online platform that was developed by GLOSOLAN with the purpose of facilitating the collections of data from PT participants and guarantee anonymity. Mr Benedetti informed the attendees that the FAO struggled to ship the soil samples to some countries in the Eurasian region especially. Ultimately, the performance of EUROSOLAN in the PT is based on the data submitted by 44 laboratories only. In this regard, five laboratories did not submit the results in time to be included in the statistical analysis and their performance will not be assessed. Mr Benedetti remarked the importance of ensuring a clear overview of the countries' regulations prior to proceeding with the shipment of the soil samples and the great opportunity given to the labs to participate to the exercise for free, as the preparation and delivery of PT samples is a time-consuming and expensive operation. This information should also be made available on the GLOSOLAN's soil import legislation (SIMPLE) database.

Mr Benedetti shared some outcomes on the performance of European and Eurasian laboratories for the carbon analysis. The overall results (on both regional and world scales) will be described in detail in the PT global report, which is under preparation. Still, all PT participants received an individual report of their performance.

The analysis of the PT results allowed for the retrieving of information concerning the most adopted methodologies. For instance, it seems that most EUROSOLAN laboratories use the Dumas method to measure soil total carbon, as 25 out of 44 participants (which correctly uploaded data on the PT platform) of the GLOSOLAN PT submitted results following this procedure. Europe was the region where Dumas was most used, compared to the rest of the world. However, Walkley and Black is also largely used in the region, as 23 submissions were received using that method. In addition to that, 13 laboratories reported SOC values using loss of ignition method. As explained above, laboratories could perform more than one methodology to determine the same parameter (e.g. both Walkley and Black and Dumas), as long as there was sufficient sample quantity.

Results obtained using Walkley and Black method (see figure 1) highlighted that the uncertainty (i.e. dispersion of the results around the consensus values) of the analysis results received from European and Eurasian laboratories participating to the PT was lower than the global values (coefficient of variation less than ten and 15 percent). Moreover, Mr Benedetti explained that within the ten-sample set received by laboratories, five samples were actually replicas of the same soil. This was done to test laboratories' precision in blindly measuring the same soil material multiple times. Overall, results suggested that EUROSOLAN members determined similar consensus values but the distribution of results around such values was quite different between replicates, revealing issues with precision. Moreover, the boxplots reported in figure 1 highlight that few outliers were present (maximum three, equals to 14 percent of the total submission for this method). Further data analysis is needed to verify whether the outliers were from the same laboratories.

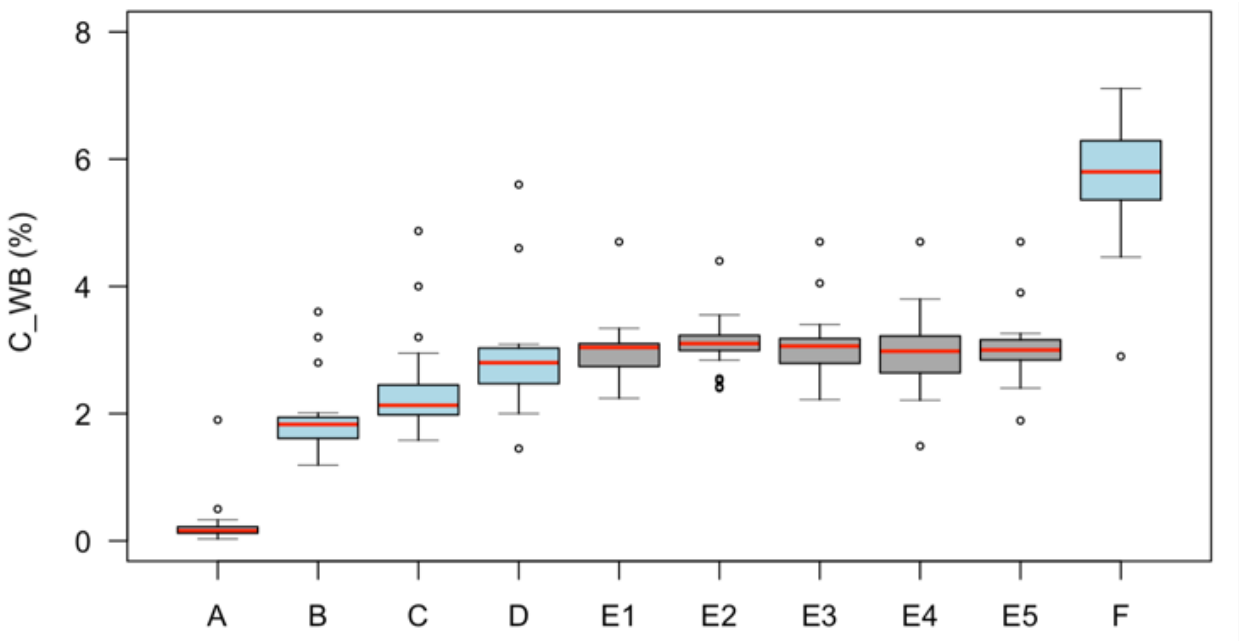

Figure 1 – Boxplots reporting the results collected from the EUROSOLAN participants to the GLOSOLAN PT 2022 for soil organic carbon using the GLOSOLAN SOP for Walkley and Black method. Letters A-F correspond to the samples delivered to laboratories ordered from the lowest to the highest carbon content. Please note that the A-F order does not coincide with the order of samples' labelling (GLO-1, GLO-2, etc.). The y-axis report carbon content (percentage).

The boxplots of figure 2 report the data collected from those EUROSOLAN members which submitted results for carbon using the Dumas method. The coefficient of variation was around five percent in this case, reporting a good overall regional performance (reaching even 22 percent for the A sample, while three percent for sample F). Overall, submissions obtained with the Dumas method gave better outcomes compared with Walkley and Black, even if differences among replicates were observed in Dumas results as well. Mr Benedetti remarked that outliers were observed even when using a high-technology instrument (such as the Dumas apparatus). In such circumstances, this is likely caused by mistakes made by laboratory staff upon transcription of analysis results, meaning that wrong results might be derived from even a correct measurement.

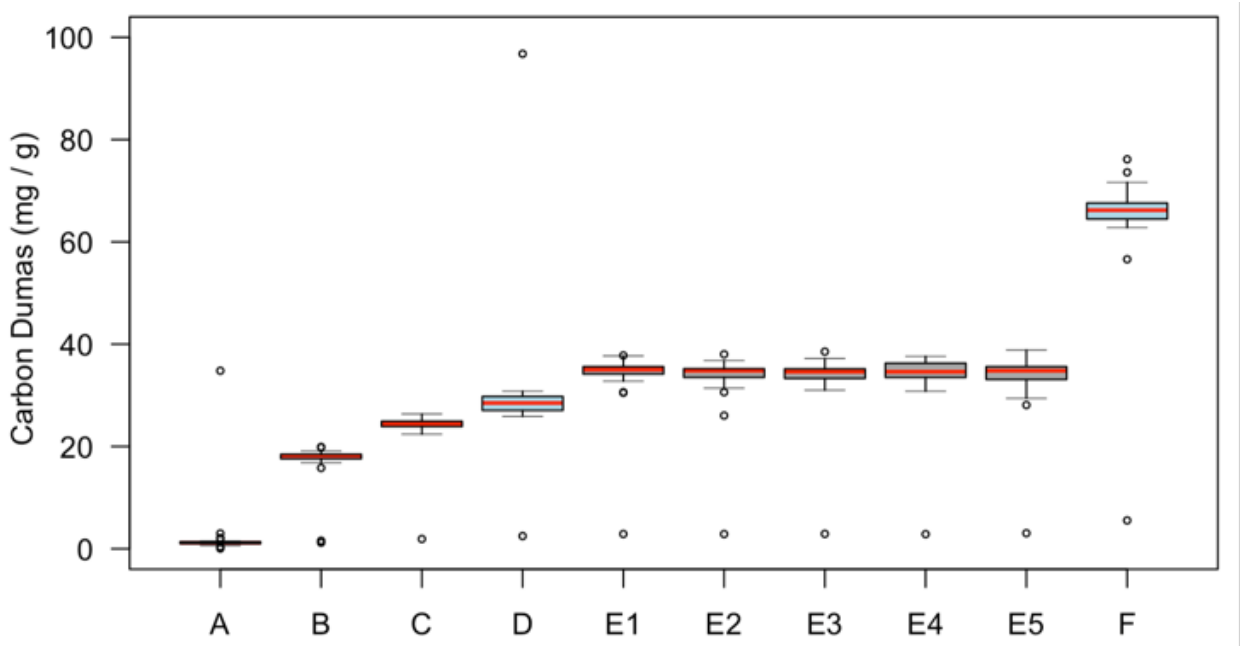

Figure 2 – Boxplots reporting the results collected from the EUROSOLAN participants to the GLOSOLAN PT 2022 for soil total carbon using the GLOSOLAN SOP for Dumas method. Letters A-F correspond to the samples delivered to laboratories ordered from the lowest to the highest carbon content. Please note that the A-F order does not coincide with the order of samples' labelling (GLO-1, GLO-2, etc.). The y-axis report carbon content (mg/g).

Mr Benedetti informed participants that the loss of ignition data had a higher coefficient of variability compared with the other two methods. Still, results revealed better precision, as shown for the replicates. The high values for samples C and D suggested that it would be rather challenging to compare results of the same soil parameter without specifying the methodology used. The few outliers reported are likely to be caused by human error, considering the apparatus needed to perform the analysis.

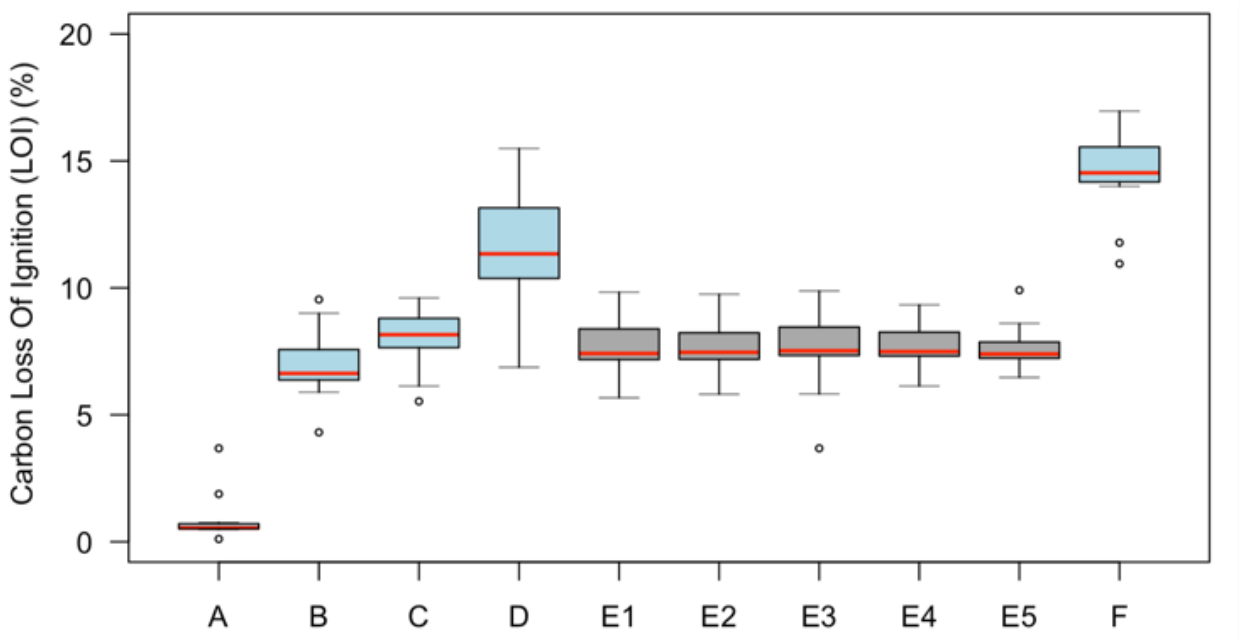

Figure 3 – Boxplots reporting the results collected from the EUROSOLAN participants to the GLOSOLAN PT 2022 for soil organic matter by loss of ignition. Letters A-F correspond to the samples delivered to laboratories ordered from the lowest to the highest carbon content. Please note that the A-F order does not coincide with the order of samples' labelling (GLO-1, GLO-2, etc.). The y-axis report carbon content (percentage).

The discussion was enriched by the presentation given by Ms Aurore Degre (GxABT, Belgium) on a PT implemented among the members of the SOPHIE network (Soil Program on Hydro-Physics via International Engagement) on the wet end of the soil water retention curve. The SOPHIE's experience suggests that the use of alternative, inert material rather than soil might be a good option when planning a PT, especially to avoid issues related to the sterilization and shipment of samples across countries. Moreover, Ms Degre remarked that sometimes systematic differences between laboratories account for most of the explained variability (especially in terms of adoption of different, not-harmonized methodologies).

EUROSOLAN members discussed the possibility to organize a regional PT. However, considering that most of laboratories in the region are already participating in other inter-laboratory exercises on a regular basis, it was decided not to organize any EUROSOLAN PT for 2023. Still, laboratories were encouraged to bring this discussion to the NASOLAN level and eventually, to consider organizing national PTs.

- Standard Operating Procedures (SOPs)

Ms Caon recalled how GLOSOLAN SOPs are harmonized, stressing that a modified procedure is followed when there are few experts on a topic in the working groups or when there are only few laboratories using a given method. In this regard, harmonization matrices are used as a reference within the working group and are not sent to the GLOSOLAN network for completion.

In order to open the discussion on the SOPs that EUROSOLAN recommends GLOSOLAN to harmonize in 2022, Ms Caon summarized the SOPs that the network harmonized already. See table 1. To note that since GLOSOLAN already harmonized the majority of methods widely used worldwide, in 2023, RESOLANs will focus on harmonizing SOPs of regional relevance.

Table 1. SOPs harmonized by GLOSOLAN in 2019 - 2022

	2019	2020	2021	2022
Chemical	OC Walkley and Black, TC Dumas, Calcium carbonate eq. (titrimetric and volumetric calcimeter methods)	Phosphorus (Bray I, Bray II, Olsen, Mehlich I), pH, electrical conductivity (in water and in saturated paste), nitrogen (Dumas, Kjeldah), carbon (Tyurin)	Particulate organic carbon (physical fractionation), Quasi-total elements (digestion using aqua regia and EPA), Exchangeable bases and CEC (ammonium acetate), available micronutrients (extraction using DTPA), Boron (hot water extraction), Mehlich III for macro and micronutrients (including S and B)	Organic matter (loss of ignition), Available phosphorus (KCl), Exchangeable acidity + Exchangeable Al (KCl), Soil buffer capacity (KOH), Fe and Al oxides (ammonium oxalate)
Physical			Particle size-distribution (hydrometer, pipette), bulk density, moisture content (gravimetric method)	Water retention (pF) curve, Particle density (pycnometer)
Biological			Microbial biomass C and N by chloroform fumigation-extraction, soil respiration	Microbial Enzyme Activities (B-Glucosidase, Arylsulfatase, Dehydrogenase), N Mineralization (incubation method), Nematodes trophic groups (wet extraction), QBSar, ISO-TSBF

EUROSOLAN will propose GLOSOLAN to harmonize the following SOPs:

- *Chemical parameters:*

  GLOBAL HARMONIZATION
  - Mineral N. To be combined with available N by calcium chloride extraction. Ms Beata Tomczyk and Ms Romic to collaborate on this.

  REGIONAL HARMONIZATION
  - CEC and exchangeable cations by hexamine cobalt trichloride extraction. Note: base saturation can be calculated from CEC results;
  - Available anions and cations by calcium chloride extraction (NH3, NO3-, P, K, Mg, Zn, Cu, Fe, Na, S, Mn);
  - P-Al/ammonium lactate-acetic acid buffer.

  Eventually:

  - Micro and macro-nutrients (also heavy metals) by X-ray fluorescence spectrometry. Ms Beata Tomczyk to lead this work. GLOSOLAN will launch a survey to determine what laboratories use this method already;
  - Organic contaminants (e.g. polycyclic aromatic hydrocarbons, PCB polychlorinated biphenyls). A collaboration with the International Network on Sol Pollution will be sought.

  The network also suggested reviewing the SOP on Dumas – organic carbon by static temperature (prior acidification). Ms Beata Tomczyk volunteered to lead this work.

- *Physical parameters:*
    - Texture determination by laser diffraction
- *Biological parameters:*
    - DNA extraction because it is at the basis of microbial identification

- Interpretation of laboratory results and provision of recommendations to farmers

Mr Hasan Sabri Öztürk, Soil Scientist and professor at Ankara University, shared with participants his experience concerning the relations between famers and soil laboratories, highlighting the importance of testing soil samples in order to provide farmers with strong scientific evidence. Still, many sources of errors and misinterpretation occur. Among all, the most common are linked to ignoring field history in terms of crops and harvest and the lack of attention to the seasonal anomalies. Mr Öztürk underlined that interpretations on soil management based on soil analysis only are not enough, as these should include also local situation (crops, nutrient balance, climate conditions, etc.).

Ms Beata Tomczyk (AgroCares, The Netherlands) shared the positive experience of his group in collaborating with a pool of agronomists from another institute to provide interpretation of soil laboratory data resulting to farmers, together with fertilizer recommendations, which were crop and management specific.

- Capacity building

In order to promote technical and scientific cooperation in the region and to further build the capacities of laboratories, EUROSOLAN proposed GLOSOLAN to create a database on laboratories available to host visiting scientists.

Mr Benedetti closed the meeting by introducing participants to the new GLOSOLAN website and by inviting them to participate in the 6th GLOSOLAN meeting from 22 to 24 November 2022. Laboratories were also invited to send video messages wishing happy birthday to GLOSOLAN in their local languages. Videos will be displayed at the *Five years of GLOSOLAN* celebration on November 10.

Venue and time of the next meeting

The fifth EUROSOLAN meeting will take place online between September and October 2023.

Annex I. List of participants

Ms Lucrezia Caon, Global Soil Partnership Secretariat, FAO HQ

Mr Filippo Benedetti, Global Soil Partnership Secretariat, FAO HQ

Ms Maria Konyushkova, Global Soil Partnership Secretariat, FAO HQ

Name	**Laboratory**	**Country**
Eva Lushi	laboratory fushe kruje	Albania
Maria Heiling	NA	Austria
Wolfgang Friesl-Hanl	Environment Agency Austria - LAB	Austria
Andrea Spanischberger	Andrea Spanischberger	Austria
Kristof Tirez	VITO	Belgium
Fien Amery	ILVO eenheid plant laboratorium Teelt en Omgeving	Belgium
Stefaan De Neve	UGent	Belgium
Cugnon Thibaut	UCLouvain	Belgium
Aurore Degre	GxABT	Belgium
Emina Sijahovic	PAM	Bosnia and Herzegovina
Hamdija Čivić	PAM	Bosnia and Herzegovina
Vladimir Ilinkin	Central laboratory, INSTITUTE OF SOIL SCIENCE, AGROTECHNOLOGIES AND PLANT PROTECTION "NIKOLA POUSHKAROV"	Bulgaria
Ivana Zegnal	Center for soil	Croatia
Marija Romić	MELILAB	Croatia
Benjamin Atlija	MELILAB	Croatia
Zeljka Zgorelec	Analytical Laboratory Department of General Agronomy Agroecology Devision Faculty of Agriculture University of Zagreb	Croatia
Jiří Čuhel	Central Institute for Supervising and Testing in Agriculture	Czech Republic
Tõnu Tõnutare	Estonian University of Life Sciences Soil Science Chair laboratory	Estonia
Mercedes Mendez	IRD	France
Ekaterine Sanadze	Ministry of Environmental Protection and Agriculture	Georgia
Giorgi Ghambashidze	Giorgi Ghambashidze	Georgia
Teona Tsetskhladze	Laboratory of Soil Fertility Research Service, Scientific-Research Centre of Agriculture	Georgia
Tamar Jolokhava	Soil Fertility Division	Georgia
Sabine Chabrillat	GFZ spectroscopy lab	Germany
Wanderson Mendes	Soil Landscape Spectral Lab	Germany

Nicole Wellbrock	thuenen	Germany
Maria Tsiafouli	Laboratory of Ecology (ECOLAB)	Greece
Kostas Karyotis	Aristotle University of Thessaloniki - Lab of RS, spectroscopy and GIS	Greece
Ágnes Nagy	NÉBIH ÉLI VNNRL	Hungary
A M Agustsdottir	Soil Conservation Service of Iceland	Iceland
Eyal Ben-Dor	Remote sensing and soil spectroscopy	Israel
Lidia Vicentini	ERSA - Agenzia regionale per lo sviluppo rurale	Italy
Chiara Cassinari	Laboratorio Ecosistemi	Italy
Nunzio Romano	Laboratory of Soil Hydrology	Italy
Adele Maria Muscolo	PEDOLOGIA mediterranea university Reggio Calabria	Italy
Daniela Bertoldi	FEM	Italy
Elio Padoan	Biosoil	Italy
Valmire Havolli	KIA	Kosovo
Lauris Leitans	State Plant Protection Service Agrochemical Laboratory	Latvia
Dace Guste	Ministry of Agriculture	Latvia
Aldis Butlers	Laboratory of Forest Environment	Latvia
Ramune Slizyte	Vytautas Magnus University	Lithuania
Lionel Leydet	ASTA	Luxembourg
Tamara Leah	Soul science	Moldova
Tatiana David	Institutul de Pedologie Agrochimie și Protecție a Solului , , N. Dimo"	Moldova
Tamara Ceban	Institutul de Pedologie Agrochimie și Protecție a Solului , , N.Dimo"	Moldova
Rodica Sîrbu	DIMO	Moldova
Tamara Ceban	Laborator de Incercari	Moldova
Winnie Van Vark	Winnie van Vark	Netherlands
Beata Tomczyk	AgroCares GSL	Netherlands
NA	University "Ss Cyril and Methodius" - Institute of Agriculture	North Macedonia
Grzegorz Siebielec	IUNG	Poland
NA	A2 Analises Quimicas	Portugal
Anabela Cachada	LabRisk	Portugal
Carmo Horta	Lab-Solos/ESACB	Portugal
Pedro Pato Martins	Applied Geochemistry Laboratory	Portugal
João Coutinho	UTAD	Portugal
Margarida Arrobas	LaSP	Portugal
Iurii Rozloga	Soil improvement laboratory	Republic of Moldova
Cojocaru Olesea	Republica Moldova	Republic of Moldova
Biljana Jordanoska Shishkoska	Laboratory for quality control of soil, water, fertilizers and plant material, Scientific Tobacco Institute - Prilep	Republic of North Macedonia

Hristina Poposka	Laboratory for soil testing, fertilizers and plant	Republic of North Macedonia
Cristian-Emilian Pop	Biologic	Romania
Nicoleta Vrinceanu	INCDPAPM - LAFC	Romania
Elena Shamrikova	Ecoanalitic	Russian Federation
Olga Yakimenko	MSU	Russian Federation
Maria Medvedeva	Laboratory for Forest PedologyForest Research Institute of the Karelian Research Centre of the Russian Academy of Sciences (FRI	Russian Federation
Евгения Минаева	Scientific laboratory "Biogeochemistry"	Russian Federation
Alikhan Akhmadov	PMPI	Russian Federation
NA	Testing Laboratory Of The Research Institute Of Chemicalization And Agroecology Of The Altai State Agrarian University	Russian Federation
Юлия Сотникова	Почвенно-экологическая лаборатория РУДН	Russian Federation
Natalya Poroshina	Laboratory of Ttechnogenic Llandscape Bbiogeochemistry	Russian Federation
Gulnara Akhmetova	Laboratory for forest pedology	Russian Federation
Branislav Jović	Labortory for IR spectroscopy, Faculty of Science, University of Novi Sad	Serbia
NA	Ministry of environmental protection	Serbia
Petra Karo Bešter	Alternative FP Slovenia	Slovenia
Tjasa Cencic Predikaka	IKEMA d.o.o.	Slovenia
Špela Velikonja Bolta	Agricultural institute of Slovenia	Slovenia
Sara Alcalde-Aparicio	EdafoLab	Spain
Paolo Di Lonardo	Wageningen Soil Lab (Soil Biology)	The Netherlands
Atilla Polat	Soil Fertilizer and Water Resources Central Resaerch Institute	Turkey
Oğuz Can Turgay	SOFREL-TR	Turkey
Onder Ozal	UTAEM_LAB	Turkey
Özge Şahin	Ankara University Soil and Fertilizer Laboratory	Turkey
Hasan Sabri Öztürk	NA	Turkey
Sevinc Madenoglu	TAGEM_Soil Fertilizer and Water Resources Research Institute	Turkey
Vecihe Incirkuş	SOil Fertilizer and water resources central research institue	Turkey
Huriye Bayram	International Agricultural Research and Training Center UTAEM LAB	Turkey
Aydogdy Agajanov	CACILM-2	Turkmenistan
Гурбанмырат Овезмырадов	FAO/GEF Project "CACILM-2"	Turkmenistan
Акмырат Гардашов	Регинальный проекта CACILM 2	Turkmenistan
Sultan Veysov	Проект КАСИЛМ-2	Turkmenistan
Oksana Samkova	Ukrainian Laboratory of Quality and Safety of Agricultural Products of NULES of Ukraine	Ukraine

Тетяна Колесникова	Україна	Ukraine
Charles Gowing	BGS	United Kingdom
Shovkat Kholdorov	QA	Uzbekistan
Uzgip	Laboratory Research Department of UZGIP LLC	Uzbekistan
Olga Bistrova	UZGIP	Uzbekistan

Annex II: Agenda

DAY 1 - October 5	
10:00 – 10.15	**Opening, endorsement of the agenda and group picture** *EUROSOLAN Chair, Ms Marija Romic* *European Soil Partnership Vice-Chair, Ms Nicole Wellbrock* *Eurasian Soil Partnership Chair, Ms Gulchekhra Khasankhanova*
10:15 - 10:50	**Item 1. Quick updates (global, regional)** • What is GLOSOLAN • Main achievements at global and regional levels • Regional capacities needs • NASOLANs: establishment and activities (stories from the region) *Ms Lucrezia Caon, GSP Secretariat*
10.50 - 11:50	**Item 2. Soil laboratories and national government: bridging the gap** • NRLs survey outcomes • National Soil Laboratory Networks • Open discussion on how to strengthen the collaboration and communication between laboratories and national Focal Points (governments) • Resource mobilization • Improvement of national soil legislation systems (soil import, waste management and disposal, drainage system, etc.) - *Mr Giacomo Rocchegiani, GSP Secretariat* • Presentation of the projects implemented/under implementation in the region (both by GSP and other organizations) • Discussion on country-specific project proposals *Moderator: Mr Giorgi Ghambashidze, EUROSOLAN Steering Committee*
11:50 - 12:00	**Item 3. Announcements** • New GLOSOLAN website • GLOSOLAN 5th anniversary celebrations • 6th GLOSOLAN meeting *Mr Filippo Benedetti, GSP Secretariat*
12:00	**Closure of the meeting**
DAY 1 - October 5	

10:00 - 10:30	**Item 4. Proficiency testing** • GLOSOLAN proficiency test (PT) 2021: regional outcomes • Regional and national PTs: case study of SOPHIE (PT on pF curve) – *Ms Aurore Degré, Mr Benjamin Guillaume - Gembloux Agro-Bio Tech ULiège* • Contribution to GLOSOLAN PT organization and implementation (link to video, NRLs survey) *Moderator: Mr Christian Hartmann, EUROSOLAN Steering Committee*
10:30 - 11:00	**Item 5. Standard Operating Procedures (SOPs)** • GLOSOLAN harmonization process (updates, introductory session organization) • Regional harmonization of methods not used worldwide • Prioritize GLOSOLAN documents to be translated *Moderator: Mr Aldis Butlers, EUROSOLAN Steering Committee*
11:00 – 11:20	**Item 6. Capacity building** • GLOSOLAN video trainings (need for more subtitles, launch a call for new videos) • GLOSOLAN webinars: call for trainers *Moderator: Mr Filippo Benedetti, GSP Secretariat*
11:20 – 11.50	**Item 7. Interpretation of laboratory results and provision of recommendations to farmers** • Develop regional-based interpretation guidelines • Experience from extension agents *Dr Hasan Sabri Ozturk, Ankara University* *Moderator: Oguz Can Turgay, EUROSOLAN Vice-Chair*
11:50 – 12:00	**Item 8. Closing remarks**
12:00	**Closure of the meeting**