

INSOP-INFA-I/23/Report



Report of the International Network on Soil Pollution (INSOP) and the International Network on Fertilizer Analysis (INFA) joint meeting on fertilizer quality

28 February 2023

Online meeting



INSOP-INFA-I/23/Report

Report of the International Network on Soil Pollution (INSOP) and the International Network on Fertilizer Analysis (INFA) joint meeting on fertilizer quality

28 February 2023, Online meeting

The designations employed and the presentation of material in this publication do not imply the expression of any opinion whatsoever on the part of the Food and Agriculture Organization of the United Nations concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

Rome, 2023

Content

1. Background	4
2. Collaboration areas and objective of the meeting	5
3. Opening of the meeting.....	5
4. Introduction to the INSOP: structure, vision and mission.....	5
5. Introduction to the INFA: structure, vision and mission	7
6. Phosphate fertilizers and threats to soil pollution: actions to be taken.....	8
7. Integrated nutrients management: an efficient move towards reduction in chemical fertilizers.....	9
8. Uranium in phosphate rock and mineral fertilizers applied to agricultural soil in East Africa	9
9. GLOSOLAN network and its support to the harmonization of SOPs.....	10
10. Open discussion and voting	10
11. Conclusion.....	11
References	12
Annex I: Meeting Agenda	13
Annex II: Poll Report.....	14
Annex III: List of participants	16

1. Background

The Voluntary Guidelines for Sustainable Soil Management (FAO, 2017) identified nutrient imbalance and soil pollution as among the main threats to soil health, leading to soil degradation, environmental deterioration, and health problems in many parts of the world. The misuse or overuse of synthetic and mineral fertilizers, as well as problems associated with their safety and quality, cause nutrient imbalances and damage to the health of ecosystems and people. One of the most significant global concerns regarding the quality and safety of fertilizers is the high trace element¹ content that specific phosphorus-containing fertilizer sources may have. The trace element content, particularly of cadmium (Cd), in some of the raw materials used to manufacture phosphate fertilizers creates severe and difficult-to-reverse health problems for soils, crops, their products, animals, and people. Because of the seriousness of these problems and the enormous investment needed to reverse them, a preventive approach is the most cost-effective alternative. The evaluation of fertilizer quality is an important step in moving toward a healthier and more sustainable use of mineral fertilizers, especially those containing phosphorus, because of their relevance in the productivity of agricultural systems. Given this scenario, the [Global Soil Partnership](#) (GSP) takes action through the activities of [global technical networks](#) combating soil threats. The [International Network on Soil Pollution](#) (INSOP) is the youngest technical network of the GSP, which was established in April 2022 and has the overall aim of stopping soil pollution and achieving the global goal of zero pollution. The [International Network on Fertilizer Analysis](#) (INFA) was established in December 2020 to harmonize the methodologies and protocols for the quality evaluation of fertilizers, build and strengthen the capacity of laboratories in fertilizer analysis and improve quality standards.

Through an inter-network collaboration, it is envisioned that INSOP and INFA act toward safer and sustainable use of fertilizers, making it clear that the evaluation and monitoring of fertilizer quality and safety is the best ally against undesirable effects of some nutrient sources on environmental quality and human and animal health. Through this collaboration, both networks will enhance their ultimate goals of achieving zero pollution and improving the quality of fertilizers.

¹ Trace elements (TE) refers to elements that are generally found in soil at low concentrations, less than 100 mg/kg, that are biologically significant in some fashion. Biological significance would include elements that are essential or toxic to any organism where some elements can be both, depending on their concentration. Many of the TEs of importance are metals, while others are metalloids, non-metals, actinoids, and halogens occurring a variety of chemical states (elemental, cations, anions, oxyanions, methylated, etc.). This category can overlap or be used synonymously with terms such as potentially toxic elements, heavy metals, persistent inorganic contaminants, and inorganic contaminants (FAO and UNEP, 2021).

2. Collaboration areas and objective of the meeting

The INSOP and the INFA would like to collaborate on the following tasks:

1. Harmonize laboratory methods or standard operating procedures (SOPs) for the analytical evaluation of heavy metal content in mineral and organic fertilizers.
2. Raise awareness on the importance of environmental and health safety of mineral and organic fertilizers' and recycled nutrient sources.
3. Develop and implement the permissible fertilizer limits of Cd content and threshold values for Cd in agricultural soils at the regional and national levels.

Therefore, the objectives of the meeting were to:

- Establish a dedicated working group composed of INSOP and INFA members.
- Agree on the list of fertilizers of priority for which the SOPs are to be developed and harmonized.
- Knowledge exchange on mineral fertilizers and their threat to soil health and food quality.

3. Opening of the meeting

The joint work on Fertilizer Quality Assessment of INSOP and INFA was held virtually on 28th February 2023. It was attended by 89 participants from 109 countries (see list of participants in Annex III). The meeting was moderated by INSOP and INFA coordinators, Mr Sergejus Ustinov and Ms Vinisa Saynes Santillan, respectively. Dr Deyi Hou, INSOP Vice-Chair and Dr Wesley Feldmann, INFA Chair welcomed the attendees.

4. Introduction to the INSOP: structure, vision and mission

Mr Sergejus Ustinov presented the INSOP objectives and governance to introduce the participants who did not participate at the previous INSOP meetings. Mr Ustinov explained that INSOP relies on a Chair and a Vice-Chair, who coordinate the activities and oversee the execution of the work plan. The current governance of INSOP is as follows:

2022-2024

Chair: Prof Ravi Naidu

Vice-Chair: Dr Deyi Hou

Assessment working area leader: Dr Ahmad Mahdavi

INSOP coordinator: Mr Sergejus Ustinov

The INSOP focuses on six main areas of work under which various tasks are being carried out to achieve the overall goal of zero pollution worldwide. The network works on improving knowledge on the full cycle of soil pollution, from assessment to remediation, as well as on the effect of environmental and human health and the provision of soil ecosystem functions and services. These areas of work are shown in figure 1.



Figure 1. INSOP areas of work

The network works closely with other GSP networks in order to achieve its global goal in reducing and eliminating soil pollution. Examples of existing and future collaborations are:

- **GLOSOLAN (Global Soil Laboratory Network)**: Harmonizing SOPs for soil contaminants. Creating the list of priority contaminants. Lab's capacity and equipment assessment.

- **INSII (International Network of Soil Information Institutions)**: Develop the methodology to map soil pollution. Generation of spatial datasets on the distribution of polluted soils.
- **NETSOB (International Network on Soil Biodiversity)**: Sustainable use and management of soil biodiversity for remediation and management of contaminated soils.
- **INFA (International Network on Fertilizer Analysis)**: SOPs on fertilizer quality analysis, sustainability and remediation for phosphate fertilizers.
- **Soil Doctors Programme**: Training on prevention and mitigation of soil pollution.

5. Introduction to the INFA: structure, vision and mission

The INFA objectives and scope were introduced by Dr Wesley Feldmann, the INFA Chair to introduce the participants with the network structure. Dr Feldmann explained that the governance of INFA relies on a Chair and a Vice-Chair, who coordinate the activities and oversee the execution of the work plan. Dr Feldmann presented a general update on the activities that have been carried out in the last year, as well as future plans and new ideas for the network. INFA counts 165 laboratories registered operating in 84 countries around the world (Figure 2). The working group 1 (WG1) - Harmonization of Methodologies for Fertilizer Analysis is subdivided into four working groups harmonizing the protocols for the evaluation of nutrient content (nitrogen, phosphorus and potassium) in organic and inorganic fertilizers. The working group 2 (WG2) - Capacity Building/Strengthening is working to ensure that laboratories operate effectively to obtain accurate and reliable results for WG1. The working group 3 (WG3) - Governance, Policy, and Regulation is working on the regulatory framework regarding fertilizer use and imports at the national, regional and global levels.

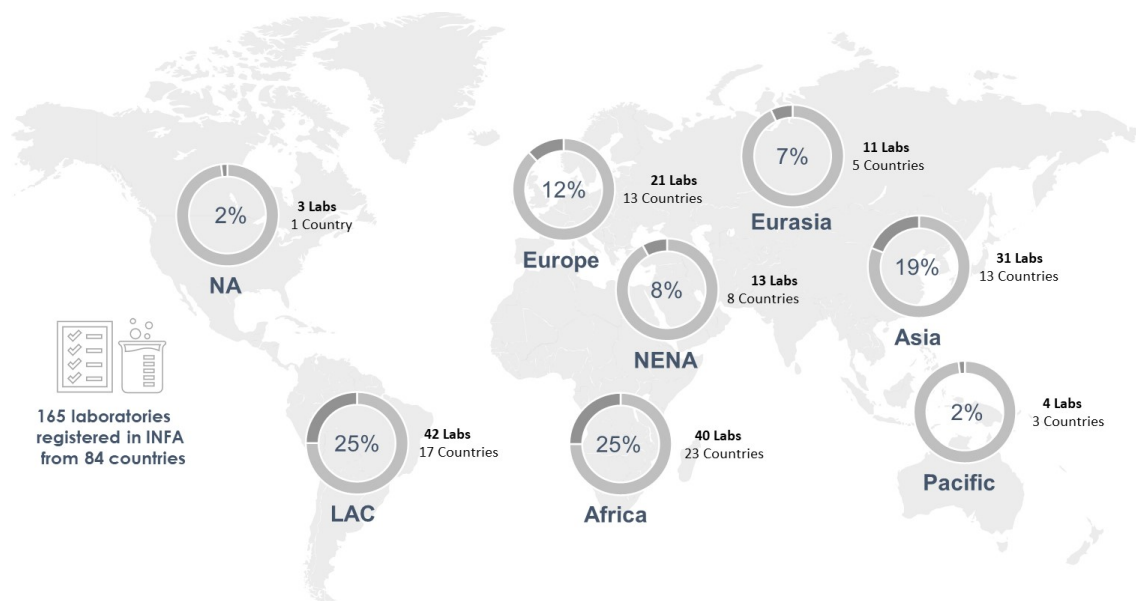


Figure 2. INFA laboratories in different regions of the world

6. Phosphate fertilizers and threats to soil pollution: actions to be taken

The presentation on phosphate fertilizers was delivered by Ms Vinisa Saynes Santillan. The purpose of presentation was to raise awareness on how the misuse of phosphate fertilizers in agricultural soils can lead to soil pollution.

To grow crops, humans have dug up about 22×10^{12} g phosphorus (P) from geological phosphate reserves to produce fertilizers. People have been practicing this for more than 50 years, quadrupling the environmental flow of P in the biogeochemical cycle. The P used in fertilizers is obtained from rock phosphate, which is a non-renewable resource that should therefore be efficiently used. The presentation emphasized that phosphate fertilizers might have a high level of Cd if the fertilizer is extracted from sedimentary phosphate rock deposits. Sedimentary rocks are about 60 times more enriched in Cd compared to non-phosphate containing rocks such as igneous deposits (European Commission, 2000).

The presentation concluded by identifying important gaps to be addressed by the network. In 2023, INFA will work together with the INSOP towards achieving the following tasks:

- Identifying the main fertilizer sources to be analysed.
- Identifying the most frequently used methods to assess fertilizer quality and safety, specifically the heavy metal content.

- Optimizing and harmonizing SOPs for the analytical evaluation of heavy metal content in phosphate fertilizers.
- Raising awareness on the importance of environmental and health safety of mineral and organic fertilizers and recycled nutrient sources.

7. Integrated nutrients management: an efficient move towards reduction in chemical fertilizers

The presentation was given by the INSOP member, Dr Amanullah Khan, from the [Department of Agronomy, University of Agriculture Peshawar](#), Pakistan. The presentation addressed the best management practices (BMPs) to reduce pollution in the soil derived from the misuse of chemical fertilizers. This can be achieved by quality control and recycle of fertilizers.

Some field experiment results from a cereal-based cropping system were shown and explained. Overall, the integrated nutrients management is an efficient move towards reducing chemical fertilizer use in current and subsequent crops under different cropping systems.

The concept of fertigation was introduced and explained. Fertigation is the technique of supplying dissolved fertiliser to crops through an irrigation system. It reduces the risks of environmental pollution as well as enables the site where it is practiced, getting the maximum yield as a result of increasing fertilizer use efficiency.

8. Uranium in phosphate rock and mineral fertilizers applied to agricultural soil in East Africa

The presentation was given by the INSOP member, Dr Jacob Bulinga Lisuma, from the [Tobacco Research Institute of Tanzania](#) (TORITA). The speaker presented results on the elevated naturally occurring uranium (U) content in phosphate rocks of East Africa and the phosphate fertilizers derived from them from Burundi, Kenya, Rwanda, Tanzania and Uganda. The concentration of U in phosphate fertilizers largely depend on the type of the phosphate rock used as a raw material.

Based on the results of the study (Mwalongo, Hanklaus and Mtei, 2022), the TORITA team recommends carrying out additional studies and risk assessments to better understand possible accumulation of radionuclides on soils and in plants in East Africa. The authors also recommend the establishment of public–private sector partnerships that could develop specific economically competitive technologies to recover U during phosphate rock processing at the deposits with the highest U concentrations. This presentation elicited interest among both network members opening the door for future collaborations.

9. GLOSOLAN network and its support to the harmonization of SOPs

The GLOSOLAN was established in 2017 to build and strengthen the capacity of laboratories in soil analysis and to respond to the need for harmonizing soil analytical data. GLOSOLAN globally harmonizes SOPs and make them available online to all users for free.

In this respect, the INSOP-INFA would like to join with the GLOSOLAN experts to develop the SOPs for fertilizers of priority, starting with mineral phosphate fertilizers.

Ms Magdeline Vlasimsky, from GLOSOLAN, explained step-by-step instructions on how to develop and harmonize SOPs. It was decided to hold a joint meeting with the GLOSOLAN to learn more about analytical capabilities of the laboratories in the harmonization of SOPs for mineral fertilizers. The upcoming meeting is planned in March 2023, subject to approval and availability of the INSOP, INFA and GLOSOLAN coordinators.

10. Open discussion and voting

During the meeting, a poll was launched in order to decide which fertilizers the INSOP-INFA networks should focus on to start with SOP harmonization activities in 2023. The following two questions were asked during the poll.

Question 1.

Which **fertilizers** do you think are a priority to analyze? (Select three max)

- Rock phosphate
- Monoammonium phosphate (MAP)
- Simple superphosphate (SSP)
- Triple superphosphate (TSP)
- Multi-nutrient fertilizers (NPK)
- Nitrophosphate (NP)
- Potassium Phosphate (PP)
- Phosphoric acid (PA)

As per the votes to question 1, the prioritization was given to analyze the following three phosphate fertilizers:

- Multi-nutrient fertilizers (NPK)
- Rock phosphate
- Triple superphosphate (TSP)

Question 2.

Which analysis for measuring heavy metal load in fertilizers do you think should be considered for the harmonization of the SOPs?

- a. Total concentration of heavy metals
- b. Heavy metal availability
- c. Both

As per the votes to question 2, majority of members voted to use both analyses to measure the heavy metal load in fertilizers (answer c): the total concentration of heavy metals and their bioavailability. All the votes are presented in the Annex III.

11. Conclusion

Ms Vinisa Saynes Santillan and Mr Sergejus Ustinov closed the meeting and thanked the participants for their attendance. To summarize the meeting, Mr Sergejus Ustinov stated that the INSOP-INFA members had agreed on the following activities and actions to be taken:

- Organize the workshop with the GLOSOLAN members to exchange knowledge and endorse the specific methodologies for the determination of total and available Cd content in soils and fertilizers, explain the harmonization process and define the governance of the joint working group.
- Consider the sources, regional differences and manufacturing process in further analysis of mineral fertilizers.
- Consider both extraction methods in the harmonization of the SOP: microwave extraction (closed system) and concentrated hydrochloric acid (HCl) in an open system. Preference should be given to the open system because it is the most accessible and used method.
- Raise awareness on the importance of environmental and health safety of mineral and organic fertilizers and recycled nutrient sources.

References

FAO. 2017. Voluntary Guidelines for Sustainable Soil Management. Food and Agriculture Organization of the United Nations. [Cited 28 February 2023].

<http://www.fao.org/3/i6874en/I6874EN.pdf>

Mwalongo, D.A., Haneklaus, N.H., Lisuma, J.B., Kivevelie, T.T., Mtei, K.M. 2022. Uranium in phosphate rocks and mineral fertilizers applied to agricultural soils in East Africa.

Environmental Science and Pollution Research. <https://doi.org/10.1007/s11356-022-24574-5>

Oosterhuis, F.H., Brouwer, F.M., Wijnants, H.J. 2000. A Possible EU wide charge on cadmium in phosphate fertilizers: Economic and environmental implications. Final Report to the European Commission. In: EC. Europa. Cited February 28th 2023.

<https://ec.europa.eu/environment/enveco/taxation/pdf/cadium.pdf>

Annex I: Meeting Agenda

11:00-11:10 | OPENING REMARKS

Prof Ravi Naidu, INSOP Chair

Dr Wesley Feldmann, INFA Chair

11:10-11:20 | Introduction to INSOP: structure, vision and mission

Mr Sergejus Ustinov, FAO GSP

11:20-11:35 | Introduction to INFA: structure, vision and mission

Dr Wesley Feldmann, INFA Chair

11:35-11:50 | Phosphate fertilizers: threats to soil pollution and actions to be taken

Ms Vinisa Saynes Santillan, FAO GSP

11:50-12:05 | Integrated Nutrient Management: an efficient move towards reduction in chemical fertilizers

Mr Amanullah Khan, The university of Agriculture Peshawar

12:05-12:20 | Uranium in phosphate rocks and mineral fertilizers applied in agricultural soils in East Africa: problems and potential solutions

Dr Jacob Bulenga Lisuma, Tobacco Research Institute of Tanzania (TORITA)

12:20-12:30 | GLOSOLAN contribution to mineral fertilizers SOP development

Ms Magdeline Vlasimsky, FAO GSP

12:30-12:55 | Open discussion: SOPs for mineral fertilizers, prioritization and step-by-step approach

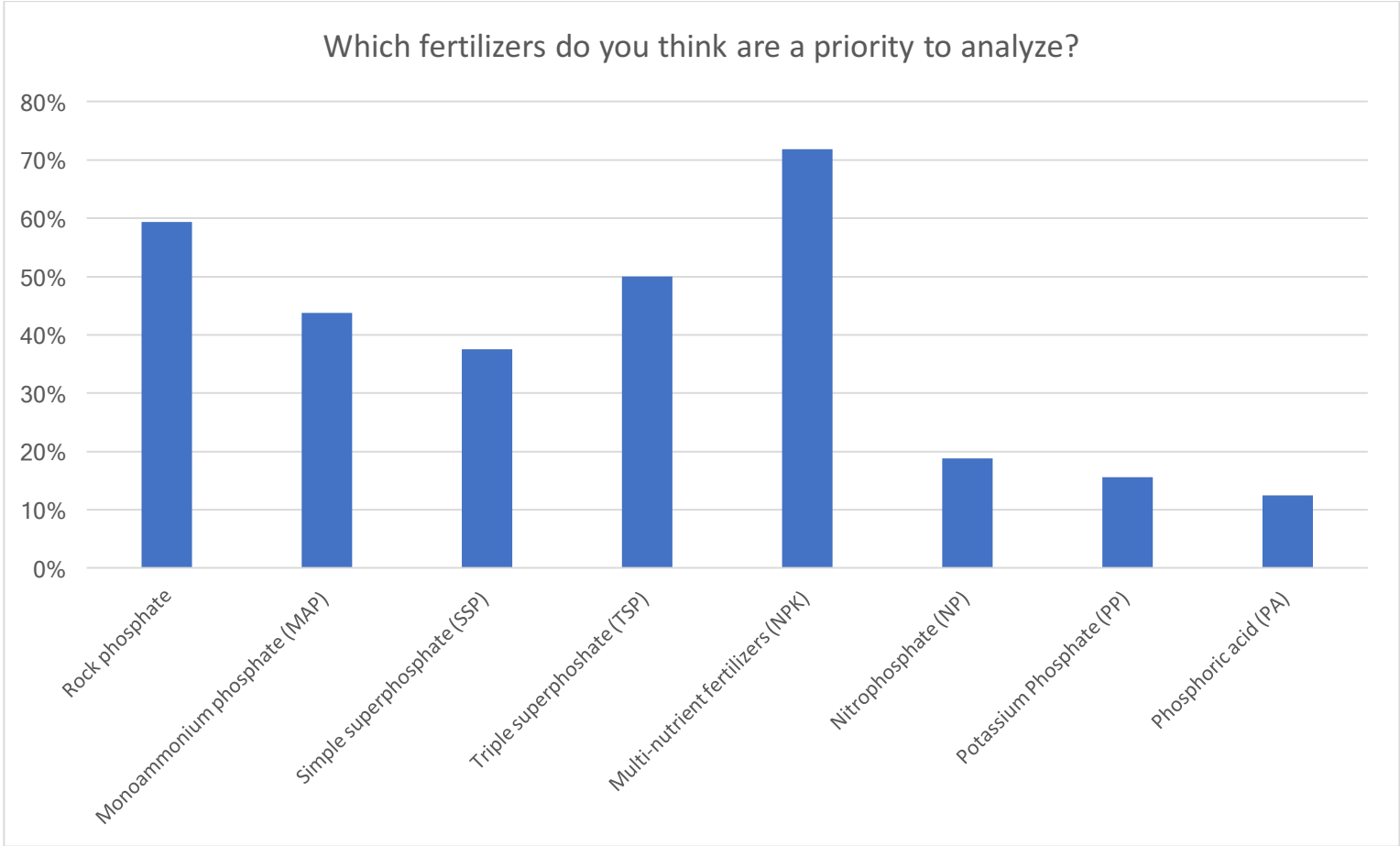
12:55-13:00 | CONCLUSION

Dr Deyi Hou, Tsinghua University, INSOP vice-chair

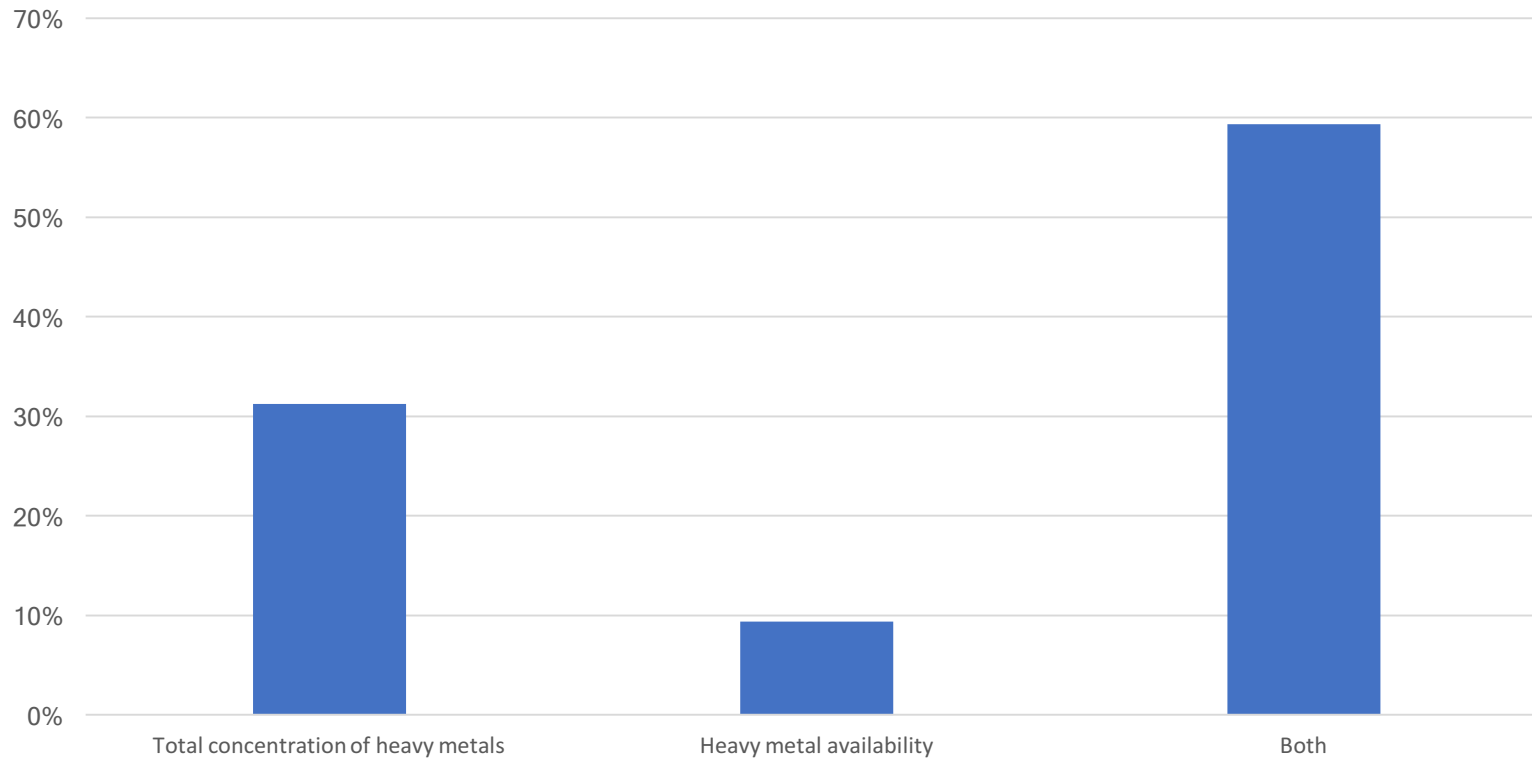
Moderated by: Mr Sergejus Ustinov and Ms Vinisa Saynes Santillan, FAO GSP

Annex II: Poll Report

Poll Results



Which analysis for measuring heavy metal load in fertilizers do you think should be considered for the harmonization of the SOPs?



Annex III: List of participants

First Name	Last Name	Organization	I am a member of:	Country	Region
Jin tanaka		UNISC International	N/A	Japan	Asia
Javier	Sáenz de Cabezón	Clean- Biotec	N/A	Spain	Europe and Eur asia
Asghar	khan	Islamia Collge Peshawar	INSOP	Pakistan	Asia
Bella	Anis	Juta Mewangi Enterprise (M) Sdn Bhd	INSOP	Malaysia	Asia
Iyenemi	Kakulu	UNEP	INSOP	Nigeria	sub-Saharan Africa
Gabrielle	de Souza	Ministry of Agriculture, Land and Fisheries	INFA	Trinidad & Tobago	Latin America and the Caribbean
Dmytro	Semenov	NSC ISSAR	INSOP	Ukraine	Europe and Eur asia
Elodie	Champseix		N/A	Belgium	Europe and Eur asia
RAKITA OLE NTUTU	RAKITA OLE NTUTU	NAROK COUNTY AGRICULTURE SECTOR STEERING COMMITTEE MEMBER	INSOP	KENYA	sub-Saharan Africa
Osama	Abu-Libda		INSOP	Libya	Near East and North Africa
Peter	Searll	Dashboard	N/A	South Africa	sub-Saharan Africa
Daniela	Pandurska	Zelenika Foundation	N/A	Bulgaria	Europe and Eurasia

Eric	van Hullebusch		N/A	France	Europe and Eurasia
Yuriy	Dmytruk		GSP member/partner but not contributing to the technical networks yet	Ukraine	Europe and Eurasia
Lauritta	Ndufeiya-Kumasi	University of PortHarcourt	INSOP	Nigeria	sub-Saharan Africa
Ahmad	Mahdavi	University of Tehran/ and Sustainable agriculture and environment	GSP member/partner but not contributing to the technical networks yet	Iran	Asia
Denis	Frolov	Lomonosov Moscow state university	INSOP	Russia	Europe and Eurasia
Abdirahman	Abdulle	Union of small farmers in Central Somalia	INSOP	Somalia	sub-Saharan Africa
Alassane	KOUSSOUBE		N/A	Burkina Faso	sub-Saharan Africa
Sherif	El-Areed	Beni-Suef University	INSOP	Egypt	Near East and North Africa
Dalel	Melki	CTZB	GSP member/partner but not contributing to the technical networks yet	Tunisia	Near East and North Africa
Titus	Thomba	Cheetah Conservation Botswana	INSOP	Botswana	sub-Saharan Africa
Peng	Li	Office of Indiana State Chemist	N/A	US	North America

carlos	ortiz	DACC	INSOP	Spain	Europe and Eur asia
Tapan	Adhya	KIIT University	INSOP	India	Asia
Rahul	Mishra	ICAR-Indian Institute of Soil Science, Bhopal	INSOP	India	Asia
Dr. Kakha	NADIRADZE	Association for Farmers Rights Dsfense, AFRD	INSOP	Georgia	Europe and Eur asia
Dra.Professor Ethel Luján	Mediza Madera		INFA	Montevideo	Latin America and the Caribbean
Ahmed	Afifi	National Research centre	N/A	Egypt	Near East and North Africa
Geetha	P.N.	World Alliance for Planetary Health	INSOP	India	Asia
Vinisa	Saynes Santillán	Global Soil Partnership	INFA	Mexico	Latin America and the Caribb ean
Veda	Obando	CORBANA	INFA	COSTA RICA	Latin America and the Caribb ean
Laura	Uribe	Laboratorio Tecnianalisis S.A.S:	INFA	Colombia	Latin America and the Caribb ean
Margarita	Hurtarte	Agrolaboratorio Ceres	INFA	Guatemala	Latin America and the Caribb ean
Lankondjoa	Kolani	Laboratoire d'Analyse des Sols	INFA	Togo	sub- Saharan Africa

Stanko	Milić	Institut of field and vegetable crops	N/A	Serbia	Europe and Eurasia
Ebrima	Jarra	The Soil Solution	INFA	The Gambia	sub-Saharan Africa
Claudia	Moreno	Colegio de Postgraduados	INFA	México	Latin America and the Caribbean
Emma	Tayad	Dept. of Agriculture	GSP member/partner but not contributing to the technical networks yet	Philippines	Asia
Dr. OKORE	Ikokuwu Kalu	Nnamdi Azikiwe University Awka	INSOP	Nigeria	sub-Saharan Africa
Paul Kristian	Berjuega	Fertilizer and Pesticide Authority	INFA	Philippines	Asia
Joseph	Uponi	CGIAR-IITA	INFA	Nigeria	sub-Saharan Africa
Subashini	Munasinghe	Dual Chelate Fertilizer Pty Ltd	INFA	Australia	Pacific
Sergio	de los Santos Villalobos	ITSON	INFA	Mexico	Latin America and the Caribbean
June	Mark	National Agriculture Research Institute - Prof.Kola Chemistry Laboratory	INFA	Papua New Guinea	Pacific
Rolf Mabicka Obame		Université des Sciences et Techniques de Masuku	INFA	Gabon	sub-Saharan Africa

Neil-Yohan	MUSADJI	Université des Sciences et Techniques de	INSOP	Gabon	sub-Saharan Africa
Jacob	Lisuma	TORITA	INSOP	Tanzania	sub-Saharan Africa
Jesus	Garcia	Sep	N/A	Mexico	Latin America and the Caribbean
Juliana	Padilla-Cuevas	COLEGIO DE POSTGRADUADOS	INSOP	México	Latin America and the Caribbean
Robert	Koigi	Kenya Plant Health Inspectorate Service	INFA	Kenya	sub-Saharan Africa
Jitendra	Kumar	ICAR-Indian Institute of Soil Science	INSOP	India	Asia
Antonia	Neto	CIAT-STP	INFA	São Tomé e Príncipe	sub-Saharan Africa
MALEFETSANE	KHESUOE	Department of Agricultural Research	INFA	Lesotho	sub-Saharan Africa
Rolf	Mabicka Obame	Université des Sciences et Techniques de Masuku	INFA	Gabon	sub-Saharan Africa
Mohammad Rafi	Salihzada	Ministry of Agriculture	INFA	Afghanistan	Asia
Tonderai (Zimbabwe)		Superfert	INFA	Zimbabwe	sub-Saharan Africa

Oscar	Chichongue		GSP member/partner but not contributing to the technical networks yet	Mozambique	sub-Saharan Africa
Giorgi	Ghambashi dze	Scientific-Research Centre of Agriculture	INSOP	Georgia	Europe and Eur asia
Senzo	Ntshakala	Ministry of Agriculture	INFA	Eswatini	sub-Saharan Africa
Šárka	Poláková	Ústřední kontrolní a zkušební ústav zemědělský	INSOP	Česko	Europe and Eur asia
Gbénonchi	Mawussi	Laboratoire d'Analyses des Sols et des Végétaux	INFA	Togo	sub-Saharan Africa
MAIDAGI	Maman	INRAN	INFA	Niger	sub-Saharan Africa
Michael	Ugen	National Agricultural Research Organization (NARO)	INFA	Uganda	sub-Saharan Africa
Hristina	Poposka	Institute of agriculture, Skopje	INFA	Republika of North Macedonia	Europe and Eur asia
Adele	Muscolo		INFA	Italy	Europe and Eur asia
Macoumba	LOUM	Institut National de Pédologie (Ministère de l'agriculture)	INFA	Sénégal	sub-Saharan Africa
MFOPOU MEWOOU	YVETTE CLARISSE	IRAD- LASPEE, CAMEROUN	INFA	Cameron	sub-Saharan Africa

Karima	Bouhafa	INRA	INFA	Maroc	Near East and North Africa
MICHELE LAURE	PEKAM	young volunteers for environment	INSOP	cameroon	sub-Saharan Africa
Aline Beatrice	NZEKET	IRAD	N/A	Cameroon	sub-Saharan Africa
Chiara	Cassinari	Laboratorio Ecosistemi	INFA	Italy	Europe and Eur asia
Jorge	Perez Peña	INTA	INFA	Argentina	Latin America and the Caribbean
Isam	Bashour	American University of Beirut	INFA	Lebanon	Asia
Djeneba	DEMBELE	Institute of Rural Economy	GSP member/partner but not contributing to the technical networks yet	Mali	sub-Saharan Africa
Jobira	Defera	Dilla University	INSOP	Ethiopia	sub-Saharan Africa
Dany	Romanos	LARI	INFA	Lebanon	Near East and North Africa
Flavia	Consolini	LFDA-SP	INFA	Brasil	Latin America and the Caribbean
ROSALINA	GONZALEZ	La Salle UNiversity	INSOP	Colombia	Latin America and the Caribbean

Suleiman	Garba	Institute for Agricultural Research Ahmadu Bello University Zaria Nigeria	INFA	Nigeria	sub-Saharan Africa
Dhouha	Zidi		INSOP	Tunisia	Near East and North Africa
Alanna Renata	Oliveira Santiago	LFDA-GO/MAPA	N/A	Brazil	Latin America and the Caribbean
Laura	Lombardo	MGAP DGSA Laboratorios	INFA	Uruguay	Latin America and the Caribbean
Ana María	García		N/A	México	Latin America and the Caribbean
Souleymane	DAMBE	LPCM/USTTB	INFA	MALI	sub-Saharan Africa
Lenin	Medina-Orozco	Tecnologico Nacional de Mexico	GSP member/partner but not contributing to the technical networks yet	Mexico	Latin America and the Caribbean
Gerardo	Ojeda	Universidad Nacional Abierta y a Distancia UNAD	INFA	Colombia	Latin America and the Caribbean
Jesús Alberto	Rodríguez Betancourt	Laboratorio de Ecotoxicología, Fagro-UCV	INFA	Venezuela	Latin America and the Caribbean
Hugh	Rodrigues	Thornton Laboratories Testing & Inspection Svcs, Inc	N/A	United States	North America

Eliezer	Augusto Baeta de Oliveira		INFA	Brazil	Latin America and the Caribbean
Bertrand	Zing Zing	Institute of Agricultural Research for Development	N/A	Cameroon	sub-Saharan Africa
José Manuel	Cena Velázquez	UNIVERSIDAD AUTÓNOMA DE CHIAPAS	INFA	MÉXICO	Latin America and the Caribbean
Bayan	Athamneh	EAD	GSP member/partner but not contributing to the technical networks yet	UAE	Asia
Surajo M.	Usaini Rimi		GSP member/partner but not contributing to the technical networks yet	Nigeria	sub-Saharan Africa
Sanjay Kumar	S/O Lachman Das	Sindh Agriculture University Sub-Campus Umerkot Pakistan	INSOP	Pakistan	Asia
Konstantine	Bziava	Georgian Technical University	N/A	Georgia	Europe and Eurasia
Mary	Idowu	Obafemi Awolowo University, Ile - Ife, Nigeria	INFA	Nigeria	sub-Saharan Africa
Beatrice	Sadina	National Agricultural Research Organisation	INFA	Uganda	sub-Saharan Africa
Samuel	Bereket	National Agricultural Research Institute	INFA	Eritrea	sub-Saharan Africa

Cioroianu	Traian Mihai	I.N.C.D.P.A.P.M. - ICPA Bucharest	INFA	Romania	Europe and Eurasia
Laura	Casas	CAR	INSOP	COLOMBIA	Latin America and the Caribbean
Kellie-Ann	Clue	ALMD	INFA	Jamaica	Latin America and the Caribbean
Henry Tamba	Nyuma	University of Liberia	INSOP	Liberia	sub-Saharan Africa
Wajira	Balasooriya	wayamba University of Sri Lanka	INSOP	Sri Lanka	Asia
Yara	Khairallah	Lebanese Agricultural Research Institute	INFA	Lebanon	Near East and North Africa
Aung Kyaw	Thu	Department of Agricultural Research	INFA	Myanmar	Asia
JACQUES	TAVARES	INIDA	INFA	Cabo Verde	sub-Saharan Africa
Claudia	Teixeira Siqueira	Federal Agricultural Laboratory	N/A	Brazil	Latin America and the Caribbean
Carlos	Saavedra	GIZ	INSOP	Bolivia	Latin America and the Caribbean
Vinai	Pitoyont	AMARC Co., LTD	INFA	Thailand	Asia
Sadia Alimatou	ILIASOU	Laboratoire d'analyse des sols et des végétaux	INFA	Togo - Lomé	sub-Saharan Africa

Williams	Egbe	Nationa Fertilizer Quality Control Laboratory, National Fertilizer Development Center (NFDC) FAMARD.	INFA	Nigeria	sub-Saharan Africa
Cho Mar	Htwe	Department of Agriculture	GSP member/partner but not contributing to the technical networks yet	Myanmar	Asia
Yan	Wang	Wageningen University	N/A	Netherlands	Europe and Eurasia
Nora	Talain	Department of Agriculture Region 4A Philippines	INFA	Philippines	Asia
OPPO A15			N/A	Philippines	Asia
John Michael	Fabellar		N/A	Philippines	Asia
Prof. Dr.	Amanullah	The University of Agriculture Peshawar, Pakistan	INSOP	Pakistan	Asia
Amina	Aboubakar	IRAD	INFA	Cameroun	sub-Saharan Africa
Liwayway	Honrade	Department of Agriculture IVA-Regional Soils Laboratory	N/A	Philippines	Asia
Diana Rica	Godez	Department of Agriculture Regiona IV-A CALABARZON - Regional Soils Laboratory	N/A	Philippines	Asia
Carlos	Galo	Agroterra	INSOP	Honduras	Latin America and the Caribbean
Shehu	Salihu	National Fertilizer Development Center, FMARD, Kaduna Nigeria.	INFA	Nigeria	sub-Saharan Africa
Muhammad	Riaz	Government College University Faisalabad, Pakistan	INSOP	Pakistan	Asia
Rowena	Reyes	Fertilizer and Pesticide Authority	N/A	Philippines	Asia

Dulamsuren	Byambasire n	Standartization metrology's laboratory in Selenge aimak	INFA	Mongolia	Asia
Filipe	Pedra	INIAV	N/A	Portugal	Europe and Eur asia
Rafael	Jaco	Laboratorio FUSADES	INFA	EL SALVADOR	Latin America and the Caribb ean
ROSA	MARTINEZ	Instituto Nacional de Investigaciones Forestales agrícolas y pecuarías	INFA	Mexico	Latin America and the Caribb ean
Chenda	LAI	ITC	N/A	Cambodia	Asia
Linca	Anggria	BSIP	N/A	Indonesia	Asia
Abdulmalik	Mohamme d	oromia Agricultural research institute	INSOP	Ethiopia	sub- Saharan Africa
JOSHUA MIKHEL	REYES	BUREAU OF SOILS AND WATER MANAGEMENT	INFA	Philippines	Asia
BSWM- Madonna Go Lim Tai		Bureau of Soils and Water Management	INFA	Philippines	Asia
Mary Claire Alyssa	Pras	Bureau of Soils and Water Management	GSP member/partner but not con tributing to the technical network s yet	Philippines	Asia
MÓNICA	AVILÉS	Laboratorio de Agua y Suelo, Instituto de Ciencias Agrícolas, Universidad Autónoma de Baja California	INFA	MEXICO	Latin America and the Caribb ean

Morena	Arniho	Dept. of Agriculture -Regional Soils Laboratory IV-A	INFA	Philippines	Asia
samuel	tetsopgang	Association Institute of Total Environment	INSOP	Cameroon	sub-Saharan Africa
Muhammad Saleem	Chang	Sindh Agriculture University Subcampus, Umerkot	INFA	Pakistan	Asia
Ivana	Zegnal		N/A	Croatia	Europe and Eur asia
Giovanni	Garau	Dipartimento di Agraria, University of Sassari	N/A	Italia	Europe and Eur asia
Magdeline	Vlasimsky		N/A	Italy	North America
Zhongkai	Zhou	Jiangsu Academy of Agricultural Sciences	INSOP	China	Asia
Rini	Prihatini	ISRI/BPSI TP	INFA	Indonesia	Asia
Oumnia	Saiagh	OCP group	N/A	Morocco	Near East and North Africa
Jakhongir	UljabaeV	JV LLC Ifoda Agro Kimyo Himoya	INFA	Uzbekistan	Europe and Eurasia
Pedro	Muñoz	INTA Nicaragua	INFA	Nicaragua	Latin America and the Caribbean
Alassane	Traore	Institut de technologie nucléaire appliquée	INFA	Sénégal	sub-Saharan Africa
Sanjeeb Kumar	Tripathy	Paradeep Phosphates Limited	INFA	India	Asia
seyed	cheraghi	parham gostar	INFA	iran	Near East and North Africa

Mohamed	Eida	FAO	N/A	Italy	Europe and Eurasia
CARMEN	SIRBU	Laboratory for Testing and Quality Control of Fertilizers	INFA	Romania	Europe and Eurasia
Dosseh Kouassi Atah	ANOUMOU	ITRA	GSP member/partner but not contributing to the technical networks yet	TOGO	Near East and North Africa
JULIO CESAR	CASTRO LAZO	LABORATORIO DE QUIMICA AGRICOLA - VALLE GRANDE	INFA	PERU	Latin America and the Caribbean
Olena	Gavrylenko	Laboratory of chemical and biological factors	INFA	Ukraine	Europe and Eurasia
Dr. Zainal	Abedin	Waste Concern	INFA	Bangladesh	Asia
Mile	Markoski	Faculty of Agricultural Sciences and Food - Skopje	N/A	North Macedonia	Europe and Eurasia
José Víctor	Tamariz Flores	UAP370423PP3	INSOP	México	Latin America and the Caribbean
Koleola	Abidemi	Department of Soil Science and Land Management, Federal University of Technology Minna, Nigeria	INFA	Nigeria	sub-Saharan Africa
Carolina	Olivera	FAO	GSP member/partner but not contributing to the technical networks yet	Colombia	Latin America and the Caribbean
June	Mark	National Agricultural Research Institute-Professor John Kola Chemistry Laboratory	INFA	Papua New Guinea	Pacific

Mario	Garcia Reynoso	Casa Cuervo-División Agrícola	INFA	Jalisco, México	Latin America and the Caribbean
Sambo	Pheap	Royal University of Agriculture	INFA	Cambodia	Asia
Carleen	Calimpon	Department of Agriculture RFO VII	N/A	Philippines	Asia
Hong	Wang		INFA	中国	Asia
Deyi	Hou	Tsinghua University	INSOP	China	Asia
Lenita		ISRI	INFA	Indonesia	Asia
NURIDDIN	SAMATOV	"Soil composition and repository, quality analysis center" SUE	GSP member/partner but not contributing to the technical networks yet	Uzbekistan	Europe and Eurasia
Dr. Hana'a Adel	Burezq	Kuwait Institute for Scientific Research	INFA	Kuwait	Asia
Naven	Naicker	South African Sugarcane Research Institute	INFA	South Africa	sub-Saharan Africa
Karim	Shahbazi	Soil and Water Research Institute	INSOP	Iran	Near East and North Africa
Washington	Mutatu	99 Ngundu/Tanganda road, Chiredzi, Zimbabwe	INFA	Zimbabwe	sub-Saharan Africa
Önder	Özal	UTAEM	INFA	TÜRKİYE	Europe and Eurasia
WILFREDO	DE MESA JR	Bureau of Soils and Water Management	N/A	Philippines	Asia
Inge	Van Hauteghem	FAVV	N/A	België	Europe and Eurasia

Wesley	Feldmann	Lablink Africa	INFA	South Africa	sub-Saharan Africa
Catherine Justin Senkoro		Tanzania Agricultural Research Institute (TARI Mlingano	INFA	Tanzania	sub-Saharan Africa
Oslan	Jumadi	Universitas Negeri Makassar	N/A	Indonesia	Asia
Aline	Pereira Moraes	LFDA-MAPA	INFA	Brazil	Latin America and the Caribbean
Sergejus	Ustinov		INSOP	Ireland	Europe and Eurasia
Malefetsane	Khesuoe	Department of Agricultural Research	INFA	Lesotho	sub-Saharan Africa
María Luisa	Pérez	Ideagro	INFA	Spain	Europe and Eurasia
Isabelle	Verbeke	FAO	GSP member/partner but not contributing to the technical networks yet	Italy	Europe and Eurasia
Maria Flores	Aizcorbe Arismendi	Mgap	N/A	Uruguay	Latin America and the Caribbean
Sunil	Manandhar	Land our Future	INSOP	Nepal	Asia
Dennis	Beesigamukama	International Centre of Insect Physiology and Ecology	N/A	Kenya	sub-Saharan Africa

David	Onche	Royal Roots Ltd	N/A	Nigeria	sub-Saharan Africa
Muhamad	Syaifudin	Hokkaido University	N/A	Indonesia	Asia
GIOVANA PAULINA	PARRA GALLARDO	Universidad Técnica de Cotopaxi	INSOP	Ecuador	Latin America and the Caribbean
Denis	Frolov	Географический факультет мгу	INSOP	Russia	Europe and Eurasia
David	O'Connor	Royal Agricultural University	INSOP	UK	Europe and Eur asia
Asit	Mandal	ICAR-Indian Institute of Soil Science	N/A	India	Asia
Pablo	Gibilisco		GSP member/partner but not contributing to the technical networks yet	Alemania	Europe and Eur asia
June Spencer	Cera	University of the Philippines	N/A	Philippines	Asia
Kjeevanrao	Jeevanrao	Agricultural university	N/A	India	Asia
Fei	Jin	Cardiff University	INSOP	United Kingdom	Europe and Eur asia
PAVLOS	TYROLOGO U	CERTH	INSOP	Greece	Europe and Eur asia
Anani	OGOU		GSP member/partner but not contributing to the technical networks yet	Togo	sub-Saharan Africa
Hammad	.	Directorate of Agri. Research	INSOP	Pakistan	Asia

Fiona	Barretto	African malaika	GSP member/partner but not contributing to the technical networks yet	United States	Near East and North Africa
Muhammad Talha	Baig	University of Agriculture Faisalabad	N/A	Pakistan	Asia
Zahra	Khodaparast	University of Aveiro	N/A	Portugal	Europe and Eur asia
Gilberto Morales	Guzmán	Particular	N/A	Tabasco	Latin America and the Caribbean
Alex	Espiritu		N/A	Philippines	Asia
Hussam	Hag Husein	Friedrich-Alexander-Universität Erlangen-Nürnberg	INSOP	Syria	Near East and North Africa
VIVEK	M S	University of Agricultural Sciences, Raichur	INSOP	INDIA	Asia
Patrícia	Silva	University of Aveiro	N/A	Portugal	Europe and Eur asia
Abrham Mulu	Belay		N/A	Ethiopia	Near East and North Africa
ENANG	ROGER KOGGE		INSOP	Cameroon	sub-Saharan Africa
Diène Diégane	Thiaré	Cheikh Anta Diop University	INSOP	Senegal	sub-Saharan Africa
Abdulrashid	Kasim	MOA	N/A	somalia	sub-Saharan Africa

Nicholas	Tymko	Amazon	INSOP	UK	Europe and Eur asia
Dirie Abdi	Mohamed	Somali Agricultural Development & Climate Organization	INSOP	Somalia	sub-Saharan Africa
Roël	HOUDANO N	Land and Health Association	INSOP	Benin	sub- Saharan Africa
Festus	Adelana	Federal University of Agriculture, Abeokuta	INSOP	Nigeria	sub-Saharan Africa
Reagan	Ngari	KALRO	INFA	Kenya	sub-Saharan Africa
Massamba	Diop		N/A	Morocco	Near East and North Africa
Ahmed Abdullahi	Mohamed	BARDO	GSP member/partner but not contributing to the technical networks yet	Somalia	Near East and North Africa
Dieudonné	KAKESSA	Plateforme Nationale des Organisations Paysannes et de Producteurs Agricoles du Bénin	INSOP	Bénin	sub- Saharan Africa
Guy	Mathurin	Independent Consultant	INSOP	Saint Lucia	Latin America and the Caribb ean
Tati	Syamsudin	Institut Teknologi Bandung	INSOP	Indonesia	Asia
Muhammad Nasir	Umar	NPHCDA	INSOP	Nigeria	sub-Saharan Africa

Oscar Miguel	Ahumada	NUTRIOR NPK	N/A	México	Latin America and the Caribbean
Maria	Morel	Udelar	N/A	Uruguay	Latin America and the Caribbean
Ganiyu	Bankole	Federal University of Agriculture, Abeokuta	GSP member/partner but not contributing to the technical networks yet	Nigeria	sub-Saharan Africa
Dr.Partha Pratim	Chakravorty		INSOP	India	Asia
ESMERALDA	OCHOA MARTÍNEZ		N/A	Mexico	North America
Vesna	Dragicevic	Maize Research Institute Zemun Polje	INSOP	Serbia	Europe and Eurasia
Nazaré	Couto	NOVA School of Science and Technology	INSOP	Portugal	Europe and Eurasia
SEIF EDDINE	YOUCEF KHODJA	Conservation of forest	N/A	Algeria	Near East and North Africa
Amid	Mostafaie	University of Aveiro	N/A	Portugal	Europe and Eurasia
Sindor	Pardaev	Samarkand State University	INSOP	Uzbekistan	Europe and Eur asia
ADRIANA MARGARITA	PIÑA ESCALANTE	INEGI	N/A	México	Latin America and the Caribb ean

TAQI	RAZA	University of Tennessee Knoxville	INSOP	United States	North America
Elie	NSIMBA NGEMBO	Unikin	INSOP	DR Congo	sub-Saharan Africa
Théophile Olivier BOSSE	Théophile Olivier BOSSE	Mission Permanente du Cameroun à Genève	N/A	Cameroon	sub-Saharan Africa
Heverton	Melo	State University of Ponta Grossa	N/A	Brasil	Latin America and the Caribbean
Tiequan	Zhang	Agriculture and AgriFood Canada	INSOP	Canada	North America
Dulce	Sandoval		N/A	Guatemala	Latin America and the Caribbean
Rahina	Kausar	Sawcrs	INFA	Pakistan	Asia
Abdulfatah	Umar Muhammad	Student	GSP member/partner but not contributing to the technical networks yet	Nigeria	sub-Saharan Africa
Marco	Mng'ong'o	Mbeya University of Science and Technology	N/A	Tanzania	sub-Saharan Africa
Issoufou	WATA	FAO	N/A	Niger	sub-Saharan Africa
ALIOUNE BADARA	DIEYE	INSTITUT NATIONAL DE PEDOLOGIE	N/A	SENEGAL	sub-Saharan Africa
Pravesh	Kumar	Krishi Vigyan Kendra, Siddharthnagar	INSOP	India	Asia
Yanju	Liu		INSOP	Australia	Pacific

Argyroula	Tserkezopolou		N/A	Greece	Europe and Eurasia
Shofiqul	Islam	Bangladesh Agricultural University	INSOP	Bangladesh	Asia
Getinet	Assabu	Debre Markos university	N/A	Ethiopia	sub-Saharan Africa
Pradip	Dey		INFA	India	Asia
Abdul Qadeer	Wahla		N/A	Pakistan	Asia
Souhail	Awad	Lebanese University	GSP member/partner but not contributing to the technical networks yet	Lebanon	Asia
Dr Senthivelu	Muniyandi	Tamil Nadu Agricultural University	N/A	India	Asia
Catarina	Malheiro	University of Aveiro	N/A	Portugal	Europe and Eurasia
Bertha Cecilia	Garcia Cienfuegos	National University of Tumbes	INSOP	Peru	Latin America and the Caribbean
Saloua		INSOP-INFA	GSP member/partner but not contributing to the technical networks yet	Tunisia	sub-Saharan Africa
Juan	Solano	SENA	N/A	COLOMBIA	Latin America and the Caribbean
syed Waqar Ali	Shah	University of Swabi	N/A	Pakistan	Asia

Миладин	НазаРков	Institute Bulgaria	INSOP	Bulgaria	Europe and Eurasia
Francesco Giuseppe	La Speme		N/A	Italia	Europe and Eur asia
Molefi	Mpheshea	FAO	GSP member/partner but not contributing to the technical networks yet	Italy	Europe and Eurasia
Khalfan	Mtua	TARI	N/A	Tanzania	sub-Saharan Africa
Bola	Senjobi	IITA	INSOP	Nigeria	sub-Saharan Africa
Sherlyn	Tipayno	Benguet State University	GSP member/partner but not contributing to the technical networks yet	Philippines	Asia
Juan C.	Sanchez-Hernandez	University of Castilla-La Mancha	INSOP	Spain	Europe and Eur asia
Karla Johayra	Girón Angarita	Independiente	N/A	Colombia	Latin America and the Caribbean
Emre Burcu	Özkaraova	Ondokuz Mayıs University Samsun Turkey	INSOP	Türkiye	Europe and Eur asia
Isabel	Campos	University of Aveiro-CESAM	INSOP	Portugal	Europe and Eurasia

Carla Nicole	Torre De la cruz	CEDEPAS Norte	GSP member/partner but not contributing to the technical networks yet	Perú	Latin America and the Caribbean
Liudmyla	Vasylenko	Prime Lab Tech	INFA	Ukraine	Europe and Eurasia
Rachid	MOUSSADEK	INRA/ICARDA	GSP member/partner but not contributing to the technical networks yet	Morocco	Near East and North Africa
Abdulmalik	Abubakar		GSP member/partner but not contributing to the technical networks yet	Nigeria	sub-Saharan Africa
Randy	Tumacder	Academe	INSOP	Philippines	Asia
marife	rebalde		N/A	Philippines	Asia
Jeyanny	Vijayanathan	Forest Research Institute Malaysia	INSOP	Malaysia	Asia
Poasa	Nauluvula		N/A	Fiji	Pacific
会利	刘		N/A	China	Asia
Sainam	Udpuay	Department of Agriculture	N/A	Thailand	Asia
Shafar Jefri	Mokhatar	University Putra Malaysia	INSOP	Malaysia	Asia
Ashish	Rai	KVK Parsauni East Champaran Dr Rajendra Prasad Central Agricultural University Pusa Bihar	N/A	India	Asia
Ankitkumar	Chauhan	Sardarkrushinagar Dantiwada Agricultural University	INSOP	India	Asia

Rikko Jeremy	Pedroza	Department of agriculture regional soils laboratory 9	GSP member/partner but not contributing to the technical networks yet	Philippines	Asia
Neelam	Jain	Amity University Rajasthan	INSOP	India	Asia
Edwin	Portal Rivera	Instituto de Agroecología y Seguridad Alimentaria	GSP member/partner but not contributing to the technical networks yet	Bolivia	Latin America and the Caribbean
Mario	Pérez		GSP member/partner but not contributing to the technical networks yet	México	Latin America and the Caribbean
Karen	Ghazaryan	Yerevan State University	INSOP	Armenia	Europe and Eurasia
OURANIA	Tzoraki	University of the Aegean	N/A	Greece	Europe and Eurasia
Ache	Tahar	Ministère de l'eau	N/A	Tchad	sub-Saharan Africa
Talal	Darwish	National Center for Remote Sensing-National Council for Scientific Research	INSOP	Lebanon	Near East and North Africa
Fatemeh	Ahmadnia	PH.d student	N/A	Iran	Asia
Anwan	Alam	Indian Agricultural Statistical Research Institute IARI New Delhi	N/A	India	Asia
Lydia	Chabala		INSOP	Zambia	sub-Saharan Africa
Samer	Akl	Environment Agency - Abu Dhabi (EAD)	N/A	UAE	Asia

Xiaolin	Wang		INSOP	Sweden	Europe and Eurasia
Adolph	Malatji	Department of Agriculture	INSOP	South Africa	sub-Saharan Africa
Maja	Manojlovic	University of Novi Sad, Faculty of Agriculture	INSOP	Serbia	Europe and Eurasia
Ruth	Wilson		N/A	United Kingdom	Europe and Eurasia
Vassanda Coumar	Mounissamy	ICAR-Indian Institute of Soil Science	INSOP	India	Asia
pierre	diene		N/A	Senegal	sub-Saharan Africa
Nelson	Mbawala	Ministry of Livestock and Fisheries	INSOP	Tanzania	sub-Saharan Africa
Dushko	Mukaetov	Institute of Agriculture - University "Ss Cyril and Methodius"	INSOP	North Macedonia	Europe and Eurasia
GUSTAVO	BORNEMANN	fao	N/A	malawi	sub-Saharan Africa
MARIA	ALVARO	CLEAN-BIOTEC	INSOP	España	Europe and Eurasia
Grace Glend	Gabisay		GSP member/partner but not contributing to the technical networks yet	Philippines	Asia
Vladimir	Ilinkin	INSTITUTE OF SOIL SCIENCE, AGROTECHNOLOGIES AND PLANT PROTECTION "NIKOLA POUHKAROV"	N/A	Bulgaria	Europe and Eurasia

Mame Balla	Ndiaye	Ceraas	N/A	Senegal	sub-Saharan Africa
Ústřední kontrolní a zkušební	zemědělský	UKZUZ	INSOP	Česko	Europe and Eur asia
Adelaide	Perdigão		N/A	Portugal	Europe and Eur asia
Oluseun	Popoola	Yaba College of Technology, Lagos	INSOP	Nigeria	sub-Saharan Africa
Lourenz	Biñas	Department of Agriculture - Regional Soils Laboratory 9	GSP member/partner but not contributing to the technical networks yet	Philippines	Asia
Ana	Giannini	INTA	N/A	Argentina	Latin America and the Caribbean
Ashim	Batya	Research Triangle Consortium (RTC)	GSP member/partner but not contributing to the technical networks yet	Uganda	sub-Saharan Africa
Joshua Shepherd	Nyatepe	Agro Invite	N/A	Ghana	sub-Saharan Africa
Myra	Tansengco		N/A	Philippines	Asia
ABDULLAHI	SALIHI	AGRICATALYST CONSULTANTS LIMITED	N/A	Nigeria	sub-Saharan Africa
Diederik	Jacques		INSOP	Belgium	Europe and Eur asia

Mazharul	Islam	University of Chittagong	INSOP	Bangladesh	Asia
Raquel	Mano	INIAV, I.P.	INFA	Portugal	Europe and Eur asia
Maria João	Moura	INIAV	N/A	Portugal	Europe and Eur asia
Mustapha	EL JANATI	IAV Hassan II	N/A	morocco	Near East and North Africa
Hafiz Ali Usman	Zafar Iqbal		N/A	Pakistan	Asia
Abdullah Al	Mahmud	Dorsch KSA	N/A	Bangladesh	Asia
Adewale	Sedara	iowa state University, Ames, Iowa	INSOP	United States	North America
Ali	Madi	Libyan agriculture minister	N/A	Libya	Near East and North Africa
Ingrid Gauslaa	Hårstad	Grønt Kompetansesenter Mære-Skjetlein	N/A	Norway	Europe and Eurasia
José Omar	Arzabe Maure	Universidad Mayor de San Simón	N/A	Bolivia	Latin America and the Caribbean
Eduin	Landinez Ramirez		N/A	Colombia	Latin America and the Caribbean
Eleni	Karasali	Benaki Phytopathological Institute	INSOP	Greece	Europe and Eur asia
Benjamin	Afful	A Rocha KNUST	INSOP	Ghana	sub-Saharan Africa

Charity	Akao	NaSARRI	INFA	Uganda	sub-Saharan Africa
Sunil	Pandey		GSP member/partner but not contributing to the technical networks yet	Nepal	Asia
Azamat	Yershbulov	FAOKZ	GSP member/partner but not contributing to the technical networks yet	Kazakhstan	Europe and Eurasia
Cao	Dinh An Giang	Can Tho University	N/A	Vietnam	Asia
Lyuba	Nenova	ISSAPP N. Poushkarov	N/A	Bulgaria	Europe and Eurasia
Ijaz	Ahmad	Pakistan Science Foundation, Islamabad	INSOP	Pakistan	Asia
Evgenia	Mescherova	PhosAgro	N/A	Russia	Europe and Eurasia
Carsten	Tiede	Senior Experten Service, Bonn	N/A	Germany	Europe and Eurasia
VERONICA	MIGO	University of the Philippines Los Banos	INFA	Philippines	Asia
Mohammad Enayet	Hossain	University of Dhaka	INSOP	Bangladesh	Asia
MARTIN	SOLIS	COLEGIO SUPERIOR AGROPECUARIO DEL ESTADO DE GUERRERO	INSOP	MEXICO	Latin America and the Caribbean

sana	munawar	sana Munawar	N/A	United Kingdom	Europe and Eurasia
Joseva	Navunidaku a	Fiji Pine Limited	N/A	Fiji Island	Pacific
Marvin	Baekisapa	Solomon Islands National University	N/A	Solomon Islands	Pacific
Pako	Dick	Picasso Holdings (PTY)Ltd	N/A	Botswana	sub-Saharan Africa
Femida	Patel	Agri Biochem Research Lab, Panoli	INFA	India	Asia
Godfrey	Owuor		INSOP	Kenya	sub-Saharan Africa
Rudrappa	Marilingann avar	Zuari Farmhub Limited, Agricultural Development Laboratory	INFA	India	Asia
Cristina	Sempiterno	INIAV	N/A	Portugal	Europe and Eurasia
Huriye	Bayram	International Agricultural Research and Training Center / UTAEM Lab	INFA	Türkiye	Europe and Eurasia
Marthe Henriette	MOUNDJO NGUE NDAME	IRAD	N/A	Cameroon	sub-Saharan Africa
Ankita	Mohapatra		N/A	India	Asia
Pravin	Vejan	McGill University	N/A	Canada	North America
Abdoul Kader	HOUDOU SOULEY		N/A	Niger	sub-Saharan Africa

Jaume	Boixadera	Particular	GSP member/partner but not contributing to the technical networks yet	Espanya	Europe and Eurasia
Mafuza	Maya		N/A	South Africa	sub-Saharan Africa
Kathia	Peralta	Consultor Independiente	N/A	México	Latin America and the Caribbean
Evariste	Nsabimana	University of Rwanda	N/A	Rwanda	sub-Saharan Africa
Vinay	Harswal	Water For People India	N/A	India	Asia
MARIA	GONZALES	MINEDU-PERÚ	N/A	PERU	Latin America and the Caribbean
Kbn	Rayana	IAMMA, university	N/A	India	Asia
Lakeisha	Meriez		INSOP	Trinidad and Tobago	Latin America and the Caribbean
Ndiye Michael	Kebonye	University of Tübingen	N/A	Germany	Europe and Eurasia
Andani Diah	Kusumawati	Telen Orbit Putra Ltd.	N/A	Indonesia	Asia
Gennie	Soyon	Academe	N/A	Philippines	Asia
Sujata	Kumari	Birsa Agricultural University	N/A	India	Asia

Hassan Mohamed	Abdi	Global Soil partnership	GSP member/partner but not contributing to the technical networks yet	Somalia	Near East and North Africa
Dr. Abdul Sattar J.	Zaben	University of Mosul	N/A	Iraq	Asia
Joël Jordan	DZOKOU KONTCHOU	Université de Dschang	N/A	Cameroon	sub-Saharan Africa
Ahmed	Rady	EAD	N/A	UAE	Asia
ARTHUR LANDRY	TAPA TAGNY		N/A	CAMEROON	sub-Saharan Africa
Hidelitha	Msita	Tanzania Agricultural Research Institute	N/A	Tanzania	sub-Saharan Africa
KIEN	NGUYEN VAN	National Plant Genebank/ plant resources center	INSOP	Vietnam	Asia
Conly	Mathebula	UMP	N/A	South Africa	sub-Saharan Africa
VASILIKI	KINIGOPOU LOU	SWRI: SOIL & WATER RESOURCES INSTITUTE-LAND RECLAMATION DEPT. HELLENIC AGRICULTURAL ORGANIZATION DEMETER	N/A	Greece	Europe and Eur asia
Hlangano		School	GSP member/partner but not contributing to the technical networks yet	South Africa	sub-Saharan Africa
Bernd	Bussian		INSOP	Germany	Europe and Eur asia

Bram	van de Kooi	Wageningen UR - Wageningen Food Safety Research	INFA	Netherlands	Europe and Eur asia
Mariné	Blaauw	TerraAfrica	INSOP	South Africa	sub- Saharan Africa
Dessy	Septian	ISRI	INFA	Indonesia	Asia
Ratri	Rahayunita	BPSI TP	INFA	Bogor	Asia
Junell Ian	Medino	Philippine Society of Sanitary Engineers Inc	N/A	Philippines	Asia
Marco	Sánchez		N/A	México	North America