Food and Agriculture Organization of the United Nations

SOILS: WHERE FOOD BEGINS

AGENDA

Global Symposium on Soils for Nutrition

26-29 July 2022

GLOBAL SOIL PARTNERSHIP

The times indicated are local times for Rome, Italy.
Rome time is in the Central European Summer Time Zone (CEST).

SUMMARY AGENDA

26 July / DAY 1	
13.00 - 14.00	High Level Opening Session
14.00- 15.45	Keynote Speakers | Setting the scene for the GSOIL4N
15.45 - 15.55	Launch of the Photo-contest on #Soils4Nutrition & Quiz
15.55 - 16.00	Launch of the poster exhibition
27 July / DAY 2	
13.00 - 14:10	Plenary Panel - Innovations for soil fertility management
14:10- 16:00	Parallel sessions (oral and poster presentations)
28 July / DAY 3	
13.00 - 14.10	Plenary Panel - Sustainable Soil Management and Biofortification: Allies to combat malnutrition
14:10 16.00	Parallel sessions (oral and poster presentations)
29 July / DAY 4	
13.00 - 14.10	Plenary Panel - Integrated soil fertility management: a look ahead
14.10 - 15.00	Key findings and the way forward
15.00 - 15.30	Closure of the Symposium

Plenary

Parallel sessions

Tuesday 26 July

13.00
14.00

HIGH LEVEL OPENING SESSION

Moderator: Ms Maria Helena Semedo, FAO

VIDEO: SOILS FOR NUTRITION

OPENING OF THE SYMPOSIUM

Mr QU Dongyu, Director-General of the Food and Agriculture Organization of the United Nations

OPENING REMARKS

H.E. Muhammad Abdur Razzaque, Minister of Agriculture, Bangladesh;
Mr José Guajardo Reyes, Vice minister of Agriculture, Chile;
Mr Garba Yahaya, Permanent Secretary**,** Ministry of Agriculture of Niger;
Mr Gilbert F. Houngbo, President of the International Fund for Agricultural Development (IFAD);
Mr Tedros Adhanom Ghebreyesus, Director General, World Health Organization (WHO);
The Honourable Penelope Wensley AC, National Soils Advocate, Australia;
Mr Yemi Akinbamijo, Executive Director of the Forum for Agricultural Research in Africa (FARA).

VIDEO: ARTISTIC PERFORMANCE

14.00
15.45

KEYNOTE SPEAKERS | SETTING THE SCENE FOR GSOIL4N

Moderator: Ms Lynette Neufeld, FAO

Status and challenges of agri-food systems: what is the role of soil health in a scenario of conflicts and pandemics?
H.E. Gerda Verburg, UN Assistant Secretary-General & Coordinator of the Scaling Up Nutrition (SUN) Movement

Effects of the misuse of fertilizers on climate change and the environment
Mr Johan Rockström, Director Postdam Institute for Climate Change

Do we really need fertilizers to grow healthy crops?
Mr Fusuo Zhang, China Agricultural University

Status and perspectives on the production of fertilizers
Ms Alzbeta Klein, CEO International Fertilizers Association

Healthy soils for healthy and nutritious crops: combating hidden hunger
Ms Grace Kangara, University of Nottingham

Status and challenges of soils for nutrition
Ms Vinisa Saynes, FAO's Global Soil Partnership

Interactive Q&A session

15.45
16.00

Launch of the Photo-contest on #Soils4Nutrition & Quiz (Ms Isabelle Verbeke, FAO)
Launch of the poster exhibition & contest

Wednesday 27 July

Plenary Panel - Innovations for soil fertility management

13.00
14:10

Moderator: Mr Luca Montanarella, European Commission

The industry perspective, progress, and new trends to increase soil fertility in a sustainable way
Mr Amit Rastogi, Coromandel International Limited, India

Development of better, cleaner technologies for food production
Mr Prem S. Bindraban, International Fertilizer Development Center (IFDC), Ghana

Rethinking plant nutrition: current biofertilizer technologies and microbiome-based management
Ms Micaela Tosi, University of Guelph, Canada

Bioestimulants: Opportunities and challenges to increase soil fertility
Mr Antonis Angeletakis, European Biostimulants Industry Council (EBIC), Yara, United Kingdom

Soil fertility mapping for guiding fertilizers recommendation
Mr Aniss Bouraqqadi, OCP Group, Morocco

14.10
16.00

Parallel session 1: Theme 1 - Status and trends of global soil nutrient budget
Moderator: Mr Ghiath Ahmad Alloush, Tishreen University, Syria

Parallel session 2: Theme 1 - Status and trends of global soil nutrient budget
Moderator: Ms Nyambilila Abdallah Amuri, Sokoine University of Agriculture, Tanzania

Parallel session 3: Theme 1 - Status and trends of global soil nutrient budget
Moderator: Ms Isabel Luotto, Global Soil Partnerhip, FAO, Italy

Parallel session 4: Theme 3 - Impacts of soil nutrient management on the environment and climate change
Moderator: Mr Saeed Saadat, Soil and Water Research Institute, Iran

Parallel session 5: Theme 2 - Sustainable soil management for food security and better nutrition
Moderator: Mr Sheleme Beyene Jiru, Hawassa University, Ethiopia

Thursday 28 July

Plenary Panel - Sustainable Soil Management and Biofortification: Allies to combat malnutrition

13.00
14:10

Moderator: Ms. Patrizia Fracassi, FAO

The role of soils on human and animal nutrition
Mr Martin Broadley, Rothamsted Research, United Kingdom

Biofortification, an innovative approach to bridge the gap between agriculture and nutrition
Ms Jenny Walton, Harvest Plus, United States of America

Implementation of Sustainable soil management practices in the Soils4Nutrition project
Ms Carolina Olivera and Ms Cruz Ferro, Global Soil Partnership, FAO, Italy

Cost effective practices of sustainable soil management to combat malnutrition in Burkina Faso
Mr Mamoudou Traorè, National Soil Survey Office, Burkina Faso

Micronutrient fertilization strategies in Bangladesh
Mr Md Kamaruzzaman, Soil Resource Development Institute, Bangladesh

Closing remarks: underscoring feasibility and scalability of strategies to combat malnutrition

14.10
16.00

Parallel session 1

Theme 1 - Status and trends of global soil nutrient budget
Moderator: Mr Gaius Eudoxie, The University of the West Indies St. Augustine, Trinidad and Tobago

Parallel session 2

Theme 1 - Status and trends of global soil nutrient budget
Moderator: Mr Guillermo A. Studdert, Universidad Nacional de Mar del Plata (UNMP), Argentina

Parallel session 3

Theme 1 - Status and trends of global soil nutrient budget
Moderators: Ms Jeyanny Vijayanathan, Forest Research Institute Malaysia (FRIM), Malaysia
Theme 2 - Sustainable soil management for food security and better nutrition
Moderators: Ms Jeyanny Vijayanathan, Forest Research Institute Malaysia (FRIM), Malaysia

Parallel session 4

Theme 3 - Impacts of soil nutrient management on the environment and climate change
Moderator: Mr Deyi Hou, School of Environment, Tsinghua University, China

Parallel session 5

Theme 4 - Governance of soil fertility/soil nutrients
Moderator: Mr Ranjan Bhattacharyya, Indian Agricultural Research Institute (ICAR), India

Friday 29 July

Plenary Panel - Integrated soil fertility management: looking ahead

13.00
14.10

Moderator: Mr Ronald Vargas, FAO

Fifty years of Integrated Soil Fertility Management: what is next?
Mr Bernard Vanlauwe, International Institute of Tropical Agriculture (IITA), Kenya

The role of microbes to enhance soil fertility
Ms Mariangela Hungria da Cunha, Empresa Brasileira de Pesquisa Agropecuária (EMBRAPA), Brazil

Models and technological tools to improve fertilizer recommendations
Mr Jorge Delgado, United States Department of Agriculture (USDA), United States of America

Status and Challenges of Phosphorus Reserves for Agriculture: a matter of quantity and quality
Mr Gerald Steiner, Global Phoshorus Institute (GPI), Austria

Main session outcomes of the GSOIL4N

14.10
15.00

Key findings and way forward

Moderator: Ms Natalia Rodríguez Eugenio, FAO

Theme 1 - Status and trends of global soil nutrient budget
Ms SUVANNANG Nopmanee, Ministry of Science and Technology, Thailand

Theme 2 - Sustainable soil management for food security and better nutrition
Ms CUNHA DOS ANJOS Lúcia Helena, Federal Rural University of Rio de Janeiro, Brazil

Theme 3 - Impacts of soil nutrient management on the environment and climate change
Ms MUSCOLO Adele, Mediterranea University of Reggio Calabria, Italy

Theme 4 - Governance of soil fertility/soil nutrients
Mr NDZANA Georges Martial , University of Dschang, Cameroon

15.00
15.30

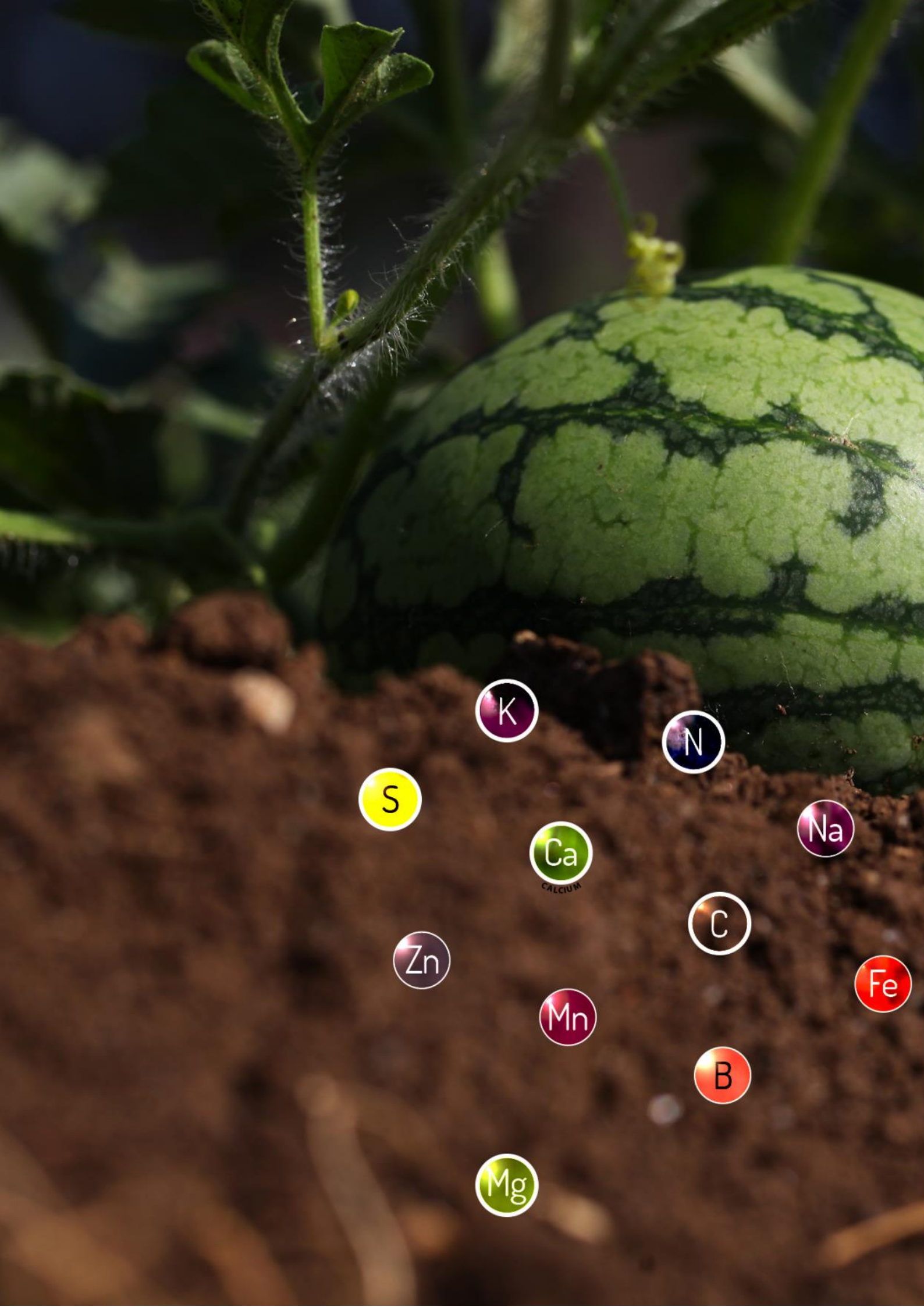
Closure of the Symposium

Moderator: Ms Natalia Rodríguez Eugenio, FAO

Result of the GSOIL4N poster competition | Announcement of the photo contest's winners

Conclusions of the Symposium and the way forward
Mr Ronald Vargas, FAO

Closing remarks
Mr Lifeng Li, Director NSL, FAO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Detailed agenda

Parallel sessions

Wednesday 27 July

13.00 14:10

PLENARY PANEL

Innovations for soil fertility management: look ahead

Parallel session 1

14.10 16.00

Theme 1 - Status and trends of global soil nutrient budget

Moderator: Mr Ghiath Ahmad Alloush, Tishreen University, Syria

Improving crop resilience through plant microbiome
Ms TIGANI Wendalina, Leiden University, the Netherlands

Khethi Sudhaar (Improving Soil Health) & NBF (Nutritionally Balanced Farming) practices in India
Mr MUDDULURU Sree Rama Raju, SSCT PVT Limited, India

Bacterial diversity of the rhizosphere of two priority species from Miombo (*Brachystegia boehmii*) and Mopane (*Colophospermum mopane*) woodlands
Ms ALBERTO MAQUIA Ivete Sandra, Eduardo Mondlane University, Mozambique

Soybean nutrition using *Trichoderma spp.* and organic acids in the seeding furrow
Ms SCHWAMBACH Josèli, Caxias do Sul University, Brazil

Novel spent coffee ground-based biofertilizer: effects on crops and bacterial rhizospheric microbiome
Mr D'ALESSANDRO Aldo, University of Camerino, Italy

A meta-analysis approach to measure the global effect of biofertilizer on soil organic carbon stocks
Ms SINGLA Berta, BETA Technological Centre, UCC-UVIC, Spain

Efficiency of biological preparations based on nitrogen-fixing and phosphate-solubilizing bacteria for optimizing the plant nutrition
Ms NAIDONOVA Oksana, National Scientific Center "Institute for Soil Science and Agrochemistry Research named after O.N. Sokolovsky", Ukraine

Ecosystem engineering by termites (Insecta: Isoptera): implications for the restoration of degraded agroecosystems in the context of climate change
Mr AMADOU ISSOUFOU Abdourhimou, University of Diffa, Niger

Assessing nutrient management strategies in Mediterranean cropping systems under current and climate change scenarios
Ms DI BENE Claudia, Council for Agricultural Research and Economics, Research Centre for Agriculture and Environment CREA-AA, Italy

Wednesday 27 July

13.00 14:10 — **PLENARY PANEL**

Innovations for soil fertility management: look ahead

Parallel session 2

14.10 16.00

Theme 1 - Status and trends of global soil nutrient budget

Moderator: Ms Nyambilila Abdallah Amuri, Sokoine University of Agriculture, Tanzania

Biodegradable plastics: effects on functionality and fertility of two different soils
Ms MAZZON Martina, University of Bologna, Italy

Fertility and quality of soil as affected by external additives: effect of integrated biochar and polymer application
Mr MAMEDOV Amrakh, Tottori University, Japan

Inorganic fertilizer use in rice fields and its association with yield gap in different growing environments in sub-Saharan Africa
Mr JOHNSON Jean-Martial, Africa Rice Center, Côte d'Ivoire

Four directions for enhancing plant nutrition management system under arid growing season
Ms HLADKIKH Yevheniia, National Scientific Center "Institute for Soil Science and Agrochemistry Research named after O.N. Sokolovsky", Ukraine

Dissolved soil organic matter as a fertility indicator in arable soils: how local conditions control its properties and implications for climate change
Mr AL-GRAITI Thulfiqar, Eötvös Loránd University, Hungary

More than an organic fertilizer: mealworm frass as a substitute to conventional fertilizer to ensure a sustainable future
Mr BOHUON Emilien, Ÿnsect, France

Evaluation of polyhalite fertilizer for soybean balanced nutrition using a novel root phenotyping system
Ms IMAS Patricia, ICL, Israel

Effects of soil amendments on growth and protein generation of paddy grown on acid sulfate soil
Mr ABDULLAH Rosazlin, Universiti Malaya, Malaysia

Supplementary fertilization with magnesium increases both yield and nutritional quality of potato tubers in tropical soils
Mr LACERDA Santiago, Federal University of Viçosa, Brazil

Wednesday 27 July

13.00 14:10 — **PLENARY PANEL**

Innovations for soil fertility management: look ahead

Parallel session 3

14.10 16.00

Theme 1 - Status and trends of global soil nutrient budget

Moderator: Ms Isabel Luotto, Global Soil Partnership, FAO, Italy

Global Soil Nutrient and Budget map - GSNmap
Mr ANGELINI Marcos, Global Soil Partnership, FAO, Italy

Status and balance of nutrients in the agricultural soils of Iran
Mr GHAFFARI NEJAD Seyed Ali, Soil and Water Research Institute, the Islamic Republic of Iran

Phosphorus stocks in EU agricultural soils: inputs, outputs and fluxes
Mr PANAGOS Panos, European Commission - Joint Research Centre, Italy

The European Space Agency WORLDSOILS Monitoring System
Ms YAGÜE María Julia, GMV Aerospace, Spain

Towards a global nutrient budget data platform
Mr DOBERMANN Achim, International Fertilizer Association, France

Spatial analysis of the soil nutrient availability in Agricultural lands of Morocco: trends and challenges
Mr MOUSSADEK Rachid, International Center for Agricultural Research in the Dry Areas , Morocco

Modelling phosphorus soil dynamics and P budgets in European agricultural soils
Ms MUNTWYLER Anna, Joint Research Centre, Italy

Sustainable soil management for food security and better nutrition; Digital mapping and values of heavy metal quality reference in soils of the North and Northwest Fluminense, RJ
Ms BRUNO RODRIGUES Niriele, Federal Rural University of Rio de Janeiro, Brazil

Wednesday 27 July

13.00 14:10 — **PLENARY PANEL**

Innovations for soil fertility management: look ahead

Parallel session 4

14.10 16.00

Theme 3 - Impacts of soil nutrient management on the environment and climate change

Moderator: Mr Saeed Saadat, Soil and Water Research Institute, Iran

Identification of wheat root traits that improve soil structure and optimize nitrogen cycling: the WISH-ROOTS project
Ms HERNANDEZ-SORIANO Maria, John Innes Centre, United Kingdom

Increasing the efficiency of Ukrainian agriculture in arid conditions
Ms ZAKHAROVA Maryna, National Scientific Center "Institute for Soil Science and Agrochemistry Research named after O.N. Sokolovsky", Ukraine

Biodegradable PVA/starch/bentonite polymeric blend to improve fertilizer use efficiency
Mr SARKAR Abhijit, ICAR — Indian Institute of Soil Science, Bhopal, India

FERTIMANURE: Upcycling animal manure into improved fertilising products
Ms DIAZ-GUERRA Laura, BETA Technological Center - Universitat de Vic, Spain

Composting of municipal solid waste a remedy for water pollution and soil fertility decline in Uganda
Mr MUGAMBE Christopher, Makere University, Uganda

Micronutrient management adaptations to climate change: Extrapolations from findings on copper and zinc chemistry in semi-arid to arid climate of the United States
Mr UDEIGWE Theophilus K., Bioterra, United States of America

Mixed application of compost and inorganic fertilizers increases maize (*Zea mays L.)* yields, grain minerals, and nutrient use efficiency and mitigates greenhouse gas emissions in Southwestern Ethiopia
Ms ZERSSA Gebeyanesh Worku, University of Rostock, Germany

Greenhouse Gas Emissions and dynamics of soil nutrients in coffee crops
Ms PERALTA ZUÑIGA Kathia, Postgraduate College - Campus Montecillo, Mexico

The effectiveness of Neem materials and biochar as nitrification inhibitors in reducing nitrate leaching in a compost-amended Ferric Luvisol
Mr ABEKA Hammond, CSIR - Savanna Agricultural Research Institute, Ghana

Wednesday 27 July

13.00 14:10 — **PLENARY PANEL**

Innovations for soil fertility management: look ahead

Parallel session 5

14.10 16.00

Theme 2 - Sustainable soil management for food security and better nutrition

Moderator: Mr Sheleme Beyene Jiru, Hawassa University, Ethiopia

Linking adsorption-desorption characteristics with grain Zn concentrations and uptake by teff, wheat, and maize in different landscape positions in Ethiopia
Mr DESTA Mesfin Kebede, University of Nottingham — Rothamsted Research, United Kingdom

Novel fertilizer strategy to biofortify zinc concentration in wheat grains
Mr SINGH Kuldeep, Amity University Uttar Pradesh, India

Soil factors influence the geospatial variation in zinc nutritional quality of maize in Malawi
Mr BOTOMAN Lester, Lilongwe University of Agriculture and Natural Resource, Malawi

Where do we need to apply Zn fertilizers in sub-Saharan Africa?
Ms VAN EYNDE Elise, European Commission, Joint Research Centre (JRC), Ispra, Italy

Foliar zinc fertilization in soybean
Ms BUSTOS Ana Natalia, Estación Experimental Agropecuaria Manfredi - Instituto Nacional de Tecnología Agropecuaria, Argentina

Biofortification of rice with iron and Zinc using indigenous micronutrient mobilizing beneficial rhizobacteria
Ms VAIYAPURI RAMALINGAM Prabavathy, M.S. Swaminathan Research Foundation, India

Can cobalt-ferrite nanoparticles be an alternative fertilizer for the agronomic iron fortification of wheat?
Ms PEREA VÉLEZ Yazmín Stefani, Postgraduate College, Mexico

Biofortified maize in Zimbabwe: nutritional quality depending on field position and crop management
Mr HAEFELE Stephan, University of Nottingham — Rothamsted Research, United Kingdom

Selenium biofortification of staple maize: a way to combat hidden hunger in Malawi
Ms LIGOWE Ivy Sichinga, Chitedze Agricultural Research Station Soil and Plant Nutrition Section, Malawi

Thursday 28 July

13.00 14:10 — **PLENARY PANEL**

Sustainable Soil Management and Biofortification: Allies to combat malnutrition

Parallel session 1

14.10 16.00

Theme 1 - Status and trends of global soil nutrient budget

Moderator: Mr Gaius Eudoxie, The University of the West Indies St. Augustine, Trinidad and Tobago

Agroforestry as an effective practice for sustainable soil management in olive orchards in Morocco
Ms ZAYANI Inass, University Abdelmalek Essaadi Faculty of Sciences and Techniques of Tangier, Morocco

Role of Integrated Nutrient Management for improving crop yield and enhancing soil fertility under smallholder farmers in degraded soils of Tanzania
Mr KIRIBA Deodatus Stanley, TARI—Tanzania Agricultural Research Institute, Tanzania

Prospects of sustainable food security in tribal areas with improvement in soil health by adopting practices of summer green gram cultivation
Mr JOSHI Jayesh, VAAGDHARA, India

Traditional coffee system that improves production and soil fertility
Mr ROMERO FERNANDEZ Abraham de Jesús, Postgraduate College, Mexico

Major integrated nutrient management strategies for rice-wheat cropping, and their impact on nutrient cycling, use efficiency and climate resilience of the system
Mr BHARDWAJ Ajay, ICAR — Central Soil Salinity Research Institute, India

Soil fertility improvement under conservation agriculture: effect of fertilization on soil physicochemical properties and wheat yield under both conventional and no-till systems
Ms EL MEKKAOUI Abdelali, INRA — National Institute of Agronomic Research, Morocco

The effect of different doses of organic and mineral fertilizers on the availability of trace elements in soils through the transformation of their organic matter
Mr SEMENOV Dmytro, National Scientific Center “Institute for Soil Science and Agrochemistry Research named after O.N. Sokolovsky”, Ukraine

Minimum soil disturbance and increased crop residue retention improve N, P, K, and S budgets in rice-based cropping systems
Mr JAHIRUDDIN M., Bangladesh Agricultural University, Bangladesh

Accessible and informative field tests for soil health: shade trees in coffee systems sustain life above and belowground
Ms CAMILLONE Nina, the Pennsylvania State University, United States of America

Thursday 28 July

13.00 14:10 — **PLENARY PANEL**

Sustainable Soil Management and Biofortification: Allies to combat malnutrition

Parallel session 2

14.10 16.00

Theme 1 - Status and trends of global soil nutrient budget

Moderator: Mr Guillermo A. Studdert, Universidad Nacional de Mar del Plata (UNMP), Argentina

Bioenergy, Healthy Soil and Nutrition: an exploration of the links for win-win opportunities
Ms MILLER Constance, Food and Agriculture Organisation / Global Bioenergy Partnership, Italy

Omission plot technique for assessing the nutrient contribution towards productivity of rice-maize cropping system in calcareous soils in eastern India
Mr SINGH Shiveshwar Pratap, Dr Rajendra Prasad Central Agricultural University, India

Combined effect of TRICHODERMA X SILICON X ORGANIC MATTER on the dry matter production of Chenopodium quinoa Willd. cultivated in saline soil in the Semiarid of Pernambuco
Mr SANTOS SILVA Luiz Filipe, Federal Rural University of Pernambuco, Brazil

Soil fertility status and oil palm productivity in coastal plains of southwest Cameroon
Mr KOME Georges Kogge, University of Dschang, Cameroon

Multiscale evaluation of Nitrogen Use Efficiency (NUE) in common bean (*Phaseoulus vulgaris)* under different inoculation strategies in Cuba.
Mr GÓMEZ-JORRÍN Luis, Instituto de Suelos, Cuba

Changes in nutrients contents (P, K, Mg) in topsoil over the past 30 years in mainland France
Ms CAUBET Manon, INRAE — Institut national de recherche pour l'agriculture, l'alimentation et l'environnement, France

Effect of agriculture on soil properties associated with soil health and fertility in the Argentinean pampas?
Mr SAINZ ROZAS Hernán René, IPADS Balcarce INTA-CONICET & UNMdP, Argentina

Soil nutrient management for healthy dry edible beans
Mr MAHARJAN Bijesh, University of Nebraska-Lincoln, United States of America

Enhancing seed and mace yield in nutmeg (*Myristica Fragrans*) through scientific nutrient management
Ms KUMARI Sailaja, Kerala Agricultural University, India

Thursday 28 July

13.00 14:10 — **PLENARY PANEL**

Sustainable Soil Management and Biofortification: Allies to combat malnutrition

Parallel session 3

14.10 15.00

Theme 1 - Status and trends of global soil nutrient budget

Moderator: Ms Jeyanny Vijayanathan, Forest Research Institute Malaysia (FRIM), Malaysia

Phosphorus biogeochemistry regulated by carbonates in soil
Ms GENG Yuanyuan, Nanjing Agricultural University, China

Geochemical analysis of rock waste of a mining exploitation as potential remineralizer of soil fertility
Ms CHIGLINO Leticia, Universidad de la Republica, Uruguay

Utilizing Basalt quarry wastes in improving soil fertility and the growth of rubber
Mr MOKHATAR Shafar Jefri, University Putra Malaysia, Malaysia

New protocol for phosphorus estimation in organically managed acidic soils, Meghalaya, India
Mr SWAMI Sanjay, Central Agricultural University, Imphal, India

Parallel session 3

15:00 16.00

Theme 2 - Sustainable soil management for food security and better nutrition

Moderator: Ms Jeyanny Vijayanathan, Forest Research Institute Malaysia (FRIM), Malaysia

Soil-based biofortification to alleviate selenium deficiency - An isotopic study to investigate sulphur and selenium competition for ryegrass uptake
Mr JIANG Linxi, the University of Nottingham, United Kingdom

Evidence of micronutrient fertilizer effect on agronomic fortified tef under different landscape positions in Amhara region
Ms MANZEKE-KANGARA Muneta Grace, University of Nottingham — Rothamsted Research, United Kingdom

Micronutrient constraints in sodic soils of Israna, Haryana (India)
Ms CHAHAL Seema, School of Environmental Sciences, Jawaharlal Nehru University, India

Si bioavailability and fate of the applied phytogenic silica in a soil plant system in acidic, neutral and alkaline soils
Ms ANJUM Mohsina, University of Agricultural Sciences, Bangalore, India

Thursday 28 July

13.00 14:10

PLENARY PANEL

Sustainable Soil Management and Biofortification: Allies to combat malnutrition

Parallel session 4

14.10 16.00

Theme 3 - Impacts of soil nutrient management on the environment and climate change

Moderator: Mr Deyi Hou, School of Environment, Tsinghua University, China

Status of soil pollution with heavy metals and fluorine derived from the application of high doses of phosphate fertilizers
Ms HLADKIKH Yevheniia, National Scientific Center "Institute for Soil Science and Agrochemistry Research named after O.N. Sokolovsky", Ukraine

Phosphorus fractionation in soil and sediments along a continuum from agricultural fields to lake sediments
Mr PRADHAN Satya Narayana, Banaras Hindu University, India

Evaluation of the phytotoxic effect, through tests with *Lactuca sativa*, of soils contaminated with extra heavy crude treated with a biological coupling
Ms RODRÍGUEZ URRUTIA Eliaira Andreina, Dirección de Energía y Ambiente, Fundación Instituto de Estudios Avanzados (IDEA), Venezuela

Analysis of the source of wheat lead pollution and study on soil solidification and remediation technology
Mr LIU Fuyong, University of Camerino, Italy

Characteristics of the soil conditions of the southern part of the Odessa region
Ms LIASHENKO Galina, National Scientific Center "Tairov Institut of Viticulture and Winemaking", Ukraine

Aerial deposition of polyethylene microplastics affects tomato (*Solanum lycopersicum L.*) rhizosphere ecology
Mr BOUAICHA Oussama, Free University of Bozen-Bolzano, Italy

Spatial differentiation of soil micronutrients in eroded and Pb-contaminated agricultural landscapes in the Donetsk region: availability and potential toxicity
Ms POGROMSKA Yana, State Enterprise "DG "Donetske" National Scientific Center "Institute for Soil Science and Agrochemistry Research named after O.N. Sokolovsky" (NSC ISSAR), Ukraine

Effects of biodegradable and un-biodegradable plastic mulches on soil abiotic characteristics and microbial populations involved in N cycle
Ms SANTINI Giorgia, University of Federico II of Naples, Italy

Agroecological assessment of radiocesium contamination of seeds and sunflowers on irrigated lands of the Zaporozhye region
Ms ZHYGAILO Olena, Odessa State Environmental University, Ukraine

Thursday 28 July

13.00 14:10 — **PLENARY PANEL**

Sustainable Soil Management and Biofortification: Allies to combat malnutrition

Parallel session 5

14.10 15.20

Theme 4 - Governance of soil fertility/soil nutrients

Moderator: Mr Ranjan Bhattacharyya, Indian Agricultural Research Institute (ICAR), India

Manure management and soil biodiversity: Towards more sustainable food systems in the EU
Ms KOENINGER Julia, European Commission Joint Research Centre, Italy

Sustainable soil management for food security and better nutrition
Mr BABA Mutala, CSIR - Soil Research Institute, Ghana

Effect of Government of Ghana fertilizer subsidy policy on major cereals yield
Mr LABOAN Bright Mayinl, CSIR - Soil Research Institute, Ghana

Soil governance and integrated plant nutrient management for agricultural production & sustainable ecosystem in district Chakwal-Pakistan
Mr EHSAN Muhammad, Soil and Water Testing Laboratory Chakwal, Pakistan

Sustainable Soil Management technologies upscale through Research-Extension-Farmers-Input Linkage System; Implications for effective policy implementation in Nigeria
Ms ADEJUMO Adeola, Obafemi Awolowo University, Ile- Ife, Nigeria

Friday 29 July

Plenary Panel - Integrated soil fertility management: looking ahead

13.00 – 14.10

Moderator: Mr Ronald Vargas, FAO

Fifty years of Integrated Soil Fertility Management: what is next?
Mr Bernard Vanlauwe, International Institute of Tropical Agriculture (IITA), Kenya

The role of microbes to enhance soil fertility
Ms Mariangela Hungria da Cunha, Empresa Brasileira de Pesquisa Agropecuária (EMBRAPA), Brazil

Models and technological tools to improve fertilizer recommendations
Mr Jorge Delgado, United States Department of Agriculture (USDA), United States of America

Status and Challenges of Phosphorus Reserves for Agriculture: a matter of quantity and quality
Mr Gerald Steiner, Global Phoshorus Institute (GPI), Austria

Main session outcomes of the GSOIL4N

14.10 – 15.00

Key findings and way forward

Moderator: Ms Natalia Rodríguez Eugenio, FAO

Theme 1 - Status and trends of global soil nutrient budget
Ms SUVANNANG Nopmanee, Ministry of Agriculture and Cooperatives, Thailand

Theme 2 - Sustainable soil management for food security and better nutrition
Ms CUNHA DOS ANJOS Lúcia Helena, Federal Rural University of Rio de Janeiro, Brazil

Theme 3 - Impacts of soil nutrient management on the environment and climate change
Ms MUSCOLO Adele, Mediterranea University of Reggio Calabria, Italy

Theme 4 - Governance of soil fertility/soil nutrients
Mr NDZANA Georges Martial , University of Dschang, Cameroon

15.00 – 15.30

Closure of the Symposium

Moderator: Ms Natalia Rodríguez Eugenio, FAO

Result of the GSOIL4N poster competition | Announcement of the photo contest's winners

Conclusions of the Symposium and the way forward
Mr Ronald Vargas, FAO

Closing remarks
Mr Lifeng Li, Director NSL, FAO

POSTER SESSION

THEME 1 STATUS AND TRENDS OF GLOBAL SOIL NUTRIENT BUDGET

Diverse crop rotations sustain soil management and food security in Kazakhstan

Ms AKHMETOVA Aigul, *Barayev Research and Production Center of Grain Farming, Kazakhstan*

Soil fertility and suitability evaluation for barley cultivation using GIS (geographic information system) in an arid region in Syria

Ms AL-HASN Rukea, *General Commission for Scientific Agricultural Research (GCSAR), Syria*

Profitability of Pure vs. Integrated Application of Organic and Inorganic N-Fertilizers under Rice-Wheat System

Mr AMANULLAH Khan, *The University of Agriculture Peshawar, Pakistan*

Nutrient Management of Papaya (*Carica papaya L.*) for Enhanced Yield and Fruit Quality Under Kerala Situations

Ms B. Bindu, *Kerala Agricultural University, India*

Nitrogen diagnosis in maize-forage grasses intercropping receiving nitrogen as side-dressing for production sustainability

Ms BATISTA Karina, *SAA-SP - Instituto de Zootecnia, Brazil*

Soil organic carbon stock under land management practices in the landscapes of Ethiopian highlands

Mr BAZIE Zerfu, *Amhara Region Agricultural Research Institute, Ethiopia*

Improving the soil fertility and crop productivity of intensive rice-wheat systems by crop residue recycling via integrating in nutrient management

Mr BHARDWAJ Ajay, *ICAR - Central Soil Salinity Research Institute, India*

Innovating Organic Fenugreek (*Trigonella foenum-graecum*) Cultivation Using a Unique Locally Produced Liquid Biofertilizer

Ms BUREZQ Hana'a A., *Kuwait Institute for Scientific Research, Kuwait*

Native AMF communities in hop cultivation with bokashi type fertilization in Brazil

Ms CAMPOS DE ALMEIDA Anastácia Perci, *Federal Rural University of Rio de Janeiro, Brazil*

Native arbuscular mycorrhizal fungi of salt affected soils: an alternative for enhancing P-nutrition and salt stress tolerance in crops

Ms CHANDRA Priyanka, *ICAR-Central Soil Salinity Research Institute, India*

ABRIOPACK Project: preliminary data on the effect of the use of compost added with compostable plastics on crop health and possible interactions with the rhizosphere communities

Ms COLETTA Martina, *University of Camerino, Italy*

Increasing cassava yield and quality on acid tropical soils

Ms DE SOUZA Gabrielle, *The University of the West Indies, Trinidad and Tobago*

Sustainable Plant nutrient management strategies for food and nutritional security – Current approaches and future strategies

Mr DEY P., *ICAR - Indian Institute of Soil Science, India*

Understanding the adoption of Zero Budget Natural Farming in Andhra Pradesh, India

Ms DUDDIGAN Sarah, *University of Reading, United Kingdom*

The effect of fallow technology on soil fertility of Kastanozem of cropland in Mongolia

Ms DUGAR Ariuntsetseg, *Mongolian University of Life Science, Mongolia*

Effects of poultry droppings and NPK on the growth and yield of carrot- *Daucus carota L.*

Mr EREMRENA Peter Ovie, *University of Port Harcourt, Nigeria*

The potential of cereal- legume intercropping in lowering the carbon footprints of agriculture

Ms ESNARRIAGA Dayana Naimid, *Universidad Nacional de Catamarca, Argentina*

Effect of different organic nutrient solutions on the growth and yield of Blackgram

Mr EZHUMALAI Balaji, *Annamalai University, India*

Soil salinity management in coastal smallholder vegetable production in Mozambique – the role of synthetic and organic fertilizers and manures

Mr FAMBA Sebastião, *University Eduardo Mondlane, Mozambique*

Durum wheat response to no-tillage and nitrogen fertilization in dry area of Morocco.

Ms HASSNAE Maher, *FSR-INRA-ICARDA, Morocco*

Factors in the formation of paddy soil bacterial communities

Mr IGARASHI Hajime, *Niigata University, Japan*

Effects of different Organic Mulching on soil moisture retention and crop productivity increase of maize farming system under degraded soils of Northern Tanzania

Mr JUSTINE Michael, *Tanzania Agricultural Research Institute, Tanzania*

Enhanced yield and quality in chilli with calcium, magnesium and boron nutrition

Ms K. Anjitha, *Kerala Agriculture Unversity, India*

Contribution to soil fertility management for improved climate resilience in Senegal: case of the avenir project

Mr KANE Babacar, *Alliance of Bioversity International and CIAT, Senegal*

Current state and perspective of effective use of soils of Zaporizhzha region

Ms KOLOSOVSKA Valeriya, *Odessa State Environmental University, Ukraine*

Assessment of the diversity of cultivated microorganisms in samples of soils and plants of the Aral Sea region in the autumn-winter period

Ms KONDRASHEVA Kseniya, *Institute of Microbiology of the AS RUz, Uzbekistan*

Synergistic interaction of thermochemical organic fertiliser and Piriformospora indica in growth promotion parameters of tomato

Ms M.K. Krishnapriya, *Kerala Agricultural University, India*

Rice - pasture rotation as sustainable cropping management in Entre Rios, Argentina.

Ms MAGUIRE Vanina G., *INTECH (UNSAM-CONICET), Argentina*

Nutrient management and crop paddy to improve productivity and income from salt-affected coastal soils: From a fallow establishment methods in land to a bountiful harvest

Ms MAHAJAN Gopal Ramdas, *ICAR - Central Coastal Agricultural Research Institute, India*

Potential alteration of soil extracellular enzyme activity and earthworm ingestion under different toxicity of microplastics and heavy metal mixture in soils

MAI Huong, *University of Science and Technology of Hanoi, Vietnam*

Selection of PGPR bacteria to improve and increase bean productivity

Ms MAOUGAL Rim Tinhinen, *Université des Frères Mentouri Constanine 1 - INATAA , Algeria*

Effect of different land-use management on soil organic matter content

Ms MASOUDI Malihe, *Institute of Wildlife Management and Nature Conservation, the Hungarian University of Agricultural and Life Sciences, Hungary*

Bacterial metabolites as a component of the biofertilizers dedicated to the improvement of the biological and chemical quality of the soil

Mr MUSIALOWSKI Marcin, *University of Warsaw, Poland*

Effect of long-term nutrient management practices on soil health and paddy yield of rice-rice-fallow cropping system in tropic humid climate

Ms NAHER Umme Aminun Naher, *Bangladesh Rice Research Institute, Bangladesh*

Results from two national field experiment networks with maize and wheat: effects of enhanced efficiency nitrogen fertilizers on crop yields, greenhouse gas emissions, and soil organic carbon sequestration.

Mr PERALTA E. Guillermo, *Carbon Group Agroclimatic Solutions SRL*

Hidden nutrient leaks in agricultural soils

Ms PORTOCARRERO Rocio, *Instituto Nacional de Tecnología Agropecuaria, Argentina*

Initial changes in microbial biomass, functional diversity and soil organic matter mineralisation after showing maize in an old meadow field

Ms PRIETO-FERNÁNDEZ Ángeles, *MBG sede Santiago-CSIC, Spain*

Assessing phosphorus availability for plants in Malagasy soils

Ms RAHANTALALAO Ravaka, *University of Antananarivo, Madagascar*

Use of citrus pruning waste and plant covers as a source of organic matter in soils

Mr ROS LIS Jose Vicente, *Universitat de València, Spain*

Bio-based fertilizers: some case studies

Ms ROSSI Gabriella, *CREA-AA - Consiglio per la Ricerca in Agricoltura e l'analisi dell'Economia Agraria - Centro di Ricerca Agricoltura e Ambiente, Italy*

Interactive effect of tillage and potassium: A stress mitigating strategic approach improving yield, physiology and biochemical activities of lentil in rice-fallows of eastern India

Ms SAHA Madhumonti, *ICAR-Indian Institute of Soil Science, India*

Exploring thermophilic bacteria isolated from Anhoni Hotsprings of central India for plant growth-promoting potential on pigeon pea (*Cajanus cajan*)

Ms SAHU Asha, *ICAR-Indian Institute of Soil Science, India*

State of the art on biological nitrogen fixation of leguminous crops in Argentina

Mr SALVAGIOTTI Fernando, *EEA INTA Oliveros - CONICET, Argentina*

Microbial source shapes the community of endophytic bacteria in rice roots

Mr SAMUEL OLORUNTOBA Solomon, *Niigata University, Japan*

Available phosphorus in soils of conventional and agroecological orchads of Chaco (Argentina)

Ms SCHAHOVSKOY Nara, *INTA CONICET, Argentina*

Impact of mulching on soil health and productivity of Peach (*Prunus persica L. Batsch*)

Ms SHARMA Radhika, *Dr. Yashwant Singh Parmar University of Horticulture and Forestry, India*

The potential of silicon, Trichoderma, and organic matter to promote the growth of forage sorghum under saline stress

Mr SILVA José Orlando Nunes da, *Federal Rural University of Pernambuco, Brazil*

Long-term irrigation with alkali and partially neutralized water changes soil nutrient availability, carbon fractions and microbial activities in sandy loam soils

Mr SINGH Awtar, *ICAR-Central Soil Salinity Research Institute, India*

Phosphorus and sulfur role in potato (Solanum tuberosum) nutrition on brown hill soil of Shimla, India

Ms SINGH Preeti, *ICAR-Indian Agricultural Research Institute, India*

Improve soil fertility through circular use of agricultural plant waste: new mulching techniques

Ms SOCCIARELLI Silvia, *Consiglio per la Ricerca in Agricoltura e l'analisi dell'Economia Agraria - Centro di Ricerca Agricoltura e Ambiente (CREA-AA), Italy*

Effect of simulated soil salinity conditions and varieties of pigeon pea (Cajanus cajan L.) on growth, yield and yield attributes

Ms SONI Gaytri, *Junagadh Agricultural University, India*

Rhizosphere microbiome community diversity of Coffea arabica implanted in the Gorongosa National Park (Mozambique) across different agroforestry systems

Ms TAPAÇA Inocência, *Instituto Superior de Agronomia, Portugal*

Symbiotic Properties of Soybean Rhizobia Isolated from Soils of the Nigerian Sudan Savanna

Mr UZOMA Anthony Ozoemenam, *Federal University of Technology, Nigeria*

Contributions of chiseling and winter cover crops on soil fertility and biomass yield in maize for silage production

Ms VALLE Thamires, *Federal University of Rio Grande do Sul, Brazil*

Phoretic mites as microclimate originators in special ephemeral soil habitats and as presumed co-creators of nutrient-rich soil areas using examples of Histiostomatidae (Acariformes, Astigmata)

Mr WIRTH Dr. Stefan Friedrich, *Germany*

THEME 2 SUSTAINABLE SOIL MANAGEMENT FOR FOOD SECURITY AND BETTER NUTRITION

Manganese management in different soils in relation to its availability to manganese efficient and inefficient wheat genotypes

Mr BARMAN Arijit, *ICAR-Central Soil Salinity Research Institute, India*

Sustainable Soil Management for Nutrition-sensitive Agriculture in Bangladesh

Mr BISWAS Parimal, *FAO, Bangladesh*

Sustainable soil management and biodiversity friendly practices in protected areas: The Sentina Natural Regional Reserve case study

Ms COLETTA Martina, *University of Camerino, Italy*

The issue of soil pollution solved using organic farming #03: Tried out research on soils for nutrition

Mr CHONGSERMSIRISAKUL Pathawit, *Chulalongkorn University, Thailand*

Influence of mobile iron forms on the fertility of meadow alluvial soil

Mr KAZIUTA Oleksandr, *State Biotechnological University, Ukraine*

Effect of zinc and iron biofortification on profitability and productivity of chickpea (*Cicer arietinum L.*) varieties

Ms KHARRA Rekha, *Maharana Pratap University of Agriculture & Technology, India*

On multinutrient deficiencies in rainfed agroecosystem – A case study from India

Ms MANICKAM Lalitha*, ICAR-National Bureau of Soil Survey & Land Use Planning, India*

Biofortification of romaine lettuce (*lactuca sativa L.)* on soils treated with zeolite chabazite and magnesium sulphate for better nutrition and sustainability

Ms SOCCIARELLI Silvia, *Consiglio per la Ricerca in Agricoltura e l'Analisi dell'Economia Agraria - Centro di ricerca Agricoltura e Ambiente (CREA-AA), Italy*

Nutritional evaluation of coffee soils in the North Siera of Puebla, Mexico

Mr TAMARIZ FLORES José Víctor R., *Benemérita Universidad Autónoma de Puebla, Mexico*

THEME 3 IMPACTS OF SOIL NUTRIENT MANAGEMENT ON THE ENVIRONMENT AND CLIMATE CHANGE

Assessment of heavy metal contamination in soils from selected agricultural areas in tropical Southwest India

Ms BALAKRISHNAN Shruthi, *Manipal Academy of Higher Education, India*

Potential of lignocellulolytic microbial consortia in achieving in-situ crop residue decomposition to abate residue burning

Ms BHATTACHARJYA Sudeshna, *ICAR-Indian Institute of Soil Science, India*

Dynamics of soil nitrates in a plot under onion cultivation in the Saiss Basin

Ms CHAIMAE Nessah, *National Institute for Agricultural Research (INRA), Morocco*

Suitability of plant growth-promoting bacteria to decrease nitrous oxide emissions: a case study in sugarcane

Mr CHALCO-VERA Jorge, *Instituto Nacional de Tecnología Agropecuaria, Argentina*

Available Cd mitigation through elevation of soil base saturation using lime and gypsum

Mr GALO LOZANO Carlos Hernan, *Universidade Federal do Ceará, Brazil*

The influence of climate change on the functioning of soil microbiocenosis

Ms GUMENIUK Iryna, *Institute of Agroecology, Ukraine*

Nitrogen release mechanisms of lignite-based nitrogen fertilizer in calcareous soils

Mr HUSSAIN Qaiser, *Institute of Soil and Environmental Sciences, PMAS-Arid Agriculture University, Pakistan*

Study of municipal solid waste as a resource of organic fertilizers

Mr PARDAEV Sindor, *Samarkand State University, Uzbekistan*

Bovine manure mineralization and organic matter quality on ultra high density grazing (puad) in the Colombian tropic

Ms RODRIGUEZ TORRES Eliana, *Universidad de Caldas, Colombia*

Effect of a biological system on the management of soils contaminated with extra heavy crude oil

Ms ROSAS Jesmary, *Direccion Energia y Ambiente Fundación Instituto de Estudios Avanzados (IDEA), Venezuela*

Linking straw use, carbon balance, greenhouse gas emissions, and crop growth for a sustainable sugarcane production

Mr VALENCIA-MOLINA Manuel Camilo, *Universidad de Los Llanos, Colombia*

Kuyka: an urban vermiculture experience from Cuenca-Ecuador

Ms VIVAR Verónica, *Universidad Católica de Cuenca, Ecuador*

THEME 4 GOVERNANCE OF SOIL FERTILITY/ SOIL NUTRIENTS

Governance of soil fertility for adaptation to climate change in Ukraine

Ms HETMANENKO Viktoriia, *NSC "Institute for Soil Science and Agrochemistry Research named after Sokolovsky" , Ukraine*

Governance of nutrient management in Bulgaria to reduce the risk of soil and water pollution

Mr HRISTOV Biser, *University of Forestry, Bulgaria*

How to improve the uptake of sustainable nutrient management practices in Catalonia?

Ms PECURUL BOTINES Mireia, *Science for Forest Management, Biodiversity & Bioeconomy, Spain*

Peculiarities of cation exchange capacity of agricultural soils of Kakheti region (Georgia)

Ms URUSHADZE Teo, *Agricultural University of Georgia, Georgia*

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