The Soil~Plant Analyst

A NEWSLETTER DEDICATED TO THE AGRICULTURAL LABORATORY INDUSTRY

A Quarterly Newsletter of the Soil and Plant Analysis Council, Inc., Spring 2021

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The Soil~Plant Analyst is published quarterly by The Soil and Plant Analysis Council, Inc. Editor: Robert Miller, Contact Information: Soil and Plant Analysis Council, ; Tel: 970-686-5702, email: RMiller@SP-Council.org, 2021 Vol.1

Message from President Leticia Sonon

In November 2018, the Soil and Plant Analysis Council (SPAC) Executive Board elected me as the next President of the society to serve a two-year term. I did not hesitate to accept the role because of the critical and relevant scientific services SPAC provides to the professional community. SPAC is an international society of scientists, educators, and private and public organizations with common interest in promoting analysis of soils, plants, manure, and fertilizers. The organization aims to provide leadership in the development and dissemination of methodology, interpretation, and application of analysis for efficient resource management and environmental protection.

I am Leticia Sonon, Sr. Scientist for Agronomy Research of Nutrien Ag Solutions based in Kerman, CA. I obtained my Ph.D. in Agronomy (Soil Chemistry) from Kansas State University working on persistence and movement of atrazine in soils in 1992. I finished my M.S. Soil Chemistry/Fertility from Cornell University in 1988 studying zinc chemistry in rhizosphere soils. My graduate studies were preceded by undergraduate degree in Soil Science at the Visayas State University (VSU) in the Philippines. After obtaining my Ph.D. degree, I returned to the Philippines for six years and worked as an associate professor of soil science at VSU. In 2000, I took a postdoctoral position at the Soil Chemistry Laboratory, Iowa State University. Four years later, I assumed a faculty position at the University of Georgia as Program Coordinator of the Agricultural and Environmental Services Laboratories. Eventually I became the

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Membership privileges

SPAC membership offers discounted rates for two journals: Communications in Soil Science and Plant Analysis and the Journal of Plant Nutrition. Journal subscription includes online access to past Journal issues. Membership in the Soil and Plant Analysis Council for 2021, includes quarterly newsletters, announcements on laboratory analysis workshops, laboratory supply discounts, discount registration for the international symposiums. To renew for 2021: contact Dr. Robert Miller, SPAC Secretary / Treasurer.

SPAC-ALTA Webinars

A series of instructional webinars on laboratory quality management have been developed jointly between SPAC and ALTA in 2021. The January webinar, entitled "Laboratory Quality Management, Preparing for 2021" discussed laboratory operational reviews, with focus on correction of lab errors and improvement in lab productivity. The March webinar "The laboratory SOP" discussed components of the SOP and outlined both laboratory method and process SOPs. Additional instructional webinars are planned for summer 2021 on determining method detection limits (MDL), implementing a analytical method and soil scooping techniques. Slide presentations of the past lab webinars can be found at: https://alta.ag/presentations.

SPAC Standard soil scoops

The Soil and Plant Analysis Council (SPAC) offers standard soil scoops for soil testing laboratories. Standard scoops sizes are: 1.0g, 1.5g, 2.0g, 5.0g, 10.0g and 15.0g based on an assumed soil density of 1.18 grams per cubic centimeter. Scoops are manufactured from high quality steel with wooden handles. Soil scoops are offered in multiple handle sizes, 4.0" and special order 5.0" in length, along with optional high density foam grips. Additional scoop sizes are available on a special order status and custom fabricated specialty scoops based on a specific volume and/or scooped mass can be ordered. New for 2020 SPAC offers soil spatulas for tap and soil leveling. Spatulas come in two sizes 6" or 9" blades in length.

Scoops can be purchased via an order addressed to the SPAC secretary, RMiller@SP-Council.org.

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Director of the Agricultural and Environmental Services Laboratories (AESL), University of Georgia. My role was to broaden the services of AESL to cater to the needs of Georgia farmers primarily as well as clients from all over the US and abroad. Included in the expansion of services was optimization of analytical techniques, reputable QA-QC system, modernization of instrumentation, and elevation of personnel proficiencies and qualifications.

In September 2018, I joined Actagro that later became part of Nutrien Ag Solutions, as a research lead and senior scientist. Nutrien produces various agricultural products including nutritionals, crop protection, adjuvants and biostimulates. As a scientist, my research is on understanding the dynamics of nutritional products in soils emphasizing on parameters that improve crop yield and promoting soil health. Incumbent in my functions as a soil chemist and agronomist is to develop innovations that will eventually become products for the market.

As envisioned, 2021 is the year for me step into the active role of being the SPAC President. Undoubtedly, we are still in the midst of challenges caused by the COVID 19 pandemic. It has been more than a year since face-to-face conferences had been replaced with virtual meetings and plans were oftentimes held back because of uncertainties. As time progressed and the pandemic raged on, people have become savvy at virtual meetings and getting more connected as Microsoft Teams, Zoom and other platforms are just at the tip of the fingers.

One major activity that SPAC sponsors is the bi-yearly International Symposium for Soil and Plant Analysis. The meeting attracts people from different parts of the world to present their scientific work in the area of analytical methodologies, soil fertility, new agricultural products, and more. The last meeting was held in 2019 in Wageningen, The Netherlands. The succeeding meeting was originally scheduled for 2021 and preliminary arrangements were already underway until they were halted due to the Covid-19 pandemic. It is hoped that the situation will improve soon and be able to resume the ISSPA bi-yearly symposium beginning in 2022. I am excited to see you all at our next international meeting.

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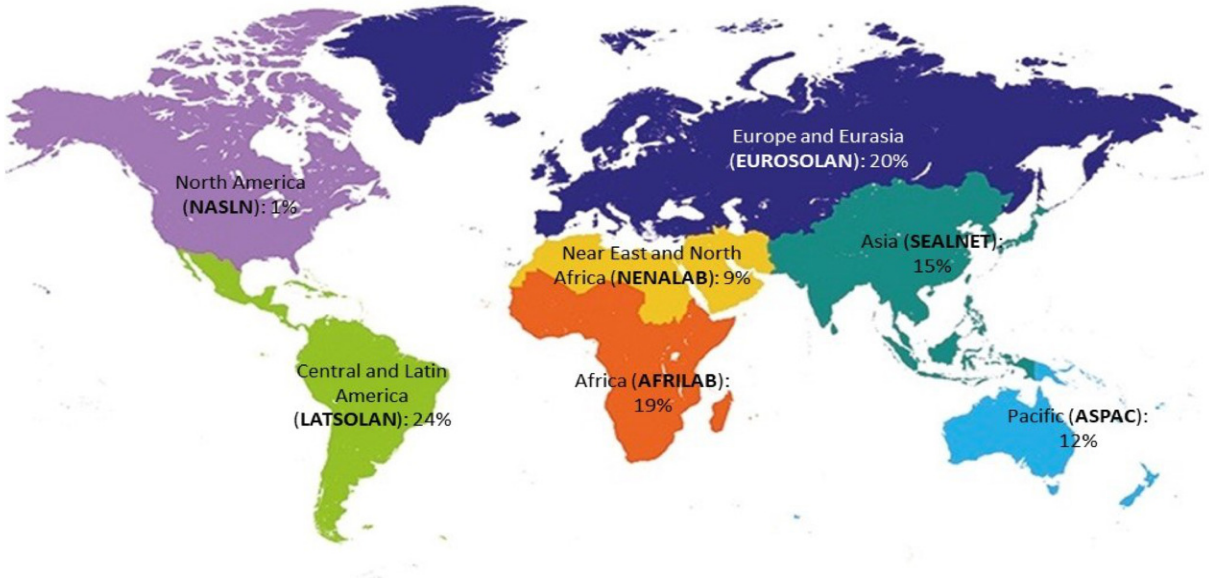
Global Soil Laboratory Network

The harmonization of methods, measurements and indicators in soil analysis is a key step in obtaining reliable data to develop sustainable soil management. For this reason, the Global Soil Partnership (GSP) established the Global Soil Laboratory Network (GLOSOLAN), established the , aiming to strengthen the performance of laboratories towards the development of standards and to harmonize soil analysis procedures in order to make soil information across laboratories, countries and regions comparable and interpretable.

Since its establishment in 2017, GLOSOLAN grouped together soil laboratories from all over the world in order to facilitate the exchange of experience and encourage the discussion on their main challenges and needs.

In order to provide opportunity for soil laboratories in all countries to involve in GLOSOLAN activities, the GSP National Focal Points from each country were asked to nominate a National Reference Laboratory to coordinate and implement the initiatives of GLOSOLAN in the country. National Reference Laboratories are also tasked to promote GLOSOLAN and motivate other soil laboratories in their country and region to join the network. This allowed GLOSOLAN to have registered around 700 member soil laboratories from more than 130 countries.

The network is organized in regional sub-networks (Regional Soil Laboratory Networks - RESOLANs), grouping together countries operating in the same GSP region. Each RESOLAN organizes an annual meeting where laboratories agree on the activities and initiatives to be implemented within the region, under the guidance of the regional Chair and Vice-Chair(s). Moreover, in order to better downscale the network activities



Skalar's range of soil, plant and fertilizer analyz

to the local context braking down language and cultural barriers, GLOSOLAN is actively working to encourage and support the establishment of National Soil Laboratory Networks (NASOLANs) . Each NASOLAN represents the lowest network level of GLOSOLAN and allows all soil laboratories in a country to interact with each other, overcome common challenges and collaborate to build their capacity in soil analysis by organizing targeted activities.

All the requests from the national and regional networks are reported and discussed in the GLOSOLAN annual meetings, in order to revise the network work plan. The latter has the ultimate objective of supporting laboratories in improving their analytical capacity. This is done by providing technical assistance from experts and organizing trainings on different topics related to laboratory procedures (analytical methods, health and safety, equipment maintenance, etc.). GLOSOLAN aims also to standardize the analytical methodologies adopted by laboratories. In this regard, members of the network play an active role in the harmonization of standard operating procedures (SOPs) for soil analysis. Following an international participatory bottom-up process, GLOSOLAN already harmonized eighteen SOPs which are available on the GLOSOLAN Best Practice Manual , providing also information on the sustainability of methods to support laboratories in making sound decisions on which method to use and to promote the transition to more sustainable methods. In addition to that, in 2021 GLOSOLAN is working on the harmonization of thirteen new SOPs covering the measurement of chemical, physical and biological soil parameters.

GLOSOLAN supports soil laboratories in monitoring the quality of their performances providing tools for the organization of both internal and external quality control assessment . Network members were involved in Proficiency Tests (PTs) organized at both global and regional scales, and GLOSOLAN is currently working to promote the organization of PTs within the regional and national networks. Registered members can join these activities for free and all the GLOSOLAN informative and training material is available on the network website in different languages. Moreover, a barter and donation system is under development to help laboratories to optimize the use of their equipment according to their actual need and capacities. In addition to this, GLOSOLAN is available to purchase new equipment for laboratories in need that show to already have a good level of proficiency in soil analysis. On the other hand, laboratories demanding improvement of their practices and quality control procedures, are trained on the relevant topics before new equipment is purchased.

GLOSOLAN is also working to raise the awareness on the new technologies application to analyze soil parameters, such as the measurement of soil spectral properties. By recognizing the potential of spectral technology in soil analysis, soil mapping and monitoring, GLOSOLAN initiative on soil spectroscopy aims to address the constraints that still hamper the wider uptake of this technology. Together with its partners, GLOSOLAN aims to build a globally representative, soil spectral calibration library (database) based on mid-infrared (MIR) spectra and the accompanying soil property reference data recorded in one gold-standard reference laboratory. This will be implemented together with a freely available and easy-to-use soil property estimation service based on the library. In the same time, GLOSOLAN will help laboratories in building the capacity for estimating soil spectral properties by organizing trainings, harmonizing methods and developing standards.

After the requests from its members and partners, GLOSOLAN accepted the challenge to work also on the assessment of fertilizers quality and established the International Network on Fertilizer Analysis (INFA) in 2020. INFA is working to collect information on the national regulations on fertilizer quality assessment and aims to build and strengthen the capacity of laboratories in fertilizer analysis. This will be done by organizing trainings, PTs, support the harmonization of fertilizer analysis procedures and the setup of a fertilizer quality monitoring system.

Laboratory visit during the annual meetings of the regional networks SEALNET).

By validating soil laboratory data, GLOSOLAN will ensure that soil management decisions are made using sound and reliable data. For this reason, the work of GLOSOLAN supports the implementation of the Sustainable Development Goals, the Agenda 2030 for Sustainable Development and the mandate of FAO on food security and nutrition.

Interested soil labs can join the network by sending an email to GSP-Secretariat@fao.org and to Lucrezia.caon@fao.org, or visit: www.fao.org/global-soil-partnership/glosolan

ALTA
AGRICULTURAL LABORATORY TESTING ASSOCIATION

The Agricultural Laboratory Testing Association is an organization of professionals dedicated to:

- Quality soil testing and analysis
- Accurate reporting
- Sound management advise
- Information sharing

For more information visit www.ALTA.AG

USCC STA Program

The United States Compost Council' Standards and Practices Committee is reviewing the list of required compost lab tests parameters specified under the Seal of Testing Assurance (STA) program. The STA tests are required routine tests of compost producers in the US. Test parameters include pH (1:5) soluble salts, nitrogen, phosphorus, potassium, calcium magnesium, moisture content, organic matter, compost stability, maturity (based on seedling bio-assay) selected pathogens and trace elements as identified by US-EPA 503 metals (As, Cd, Cu, Pb, Hg, Mo, Ni, Se and Zn), see Table 1. Test methods are published by the US Composting Council (USCC) in: Test Methods for the Examination of Compost (TMECC). Additional compost test paramaters under consideration include compost C:N ratio, NH4-N and film plastic inerts.

Table 1. USSC STA compost, current required parameters.

Compost Parameters	**Reported as**
pH (1:5)	
Soluble salts (1:5)	dS/m (mmhos/cm)
Primary plant nutrients	%, as-is (wet) & dry weight basis
Nitrogen	Total N
Phosphorus	P_2O_5
Potassium	K_2O
Calcium	Ca
Magnesium	Mg
Moisture content	%, wet weight basis
Organic matter content	%, dry weight basis
Particle size	Screen size passing through
Stability (respirometry)	mg CO_2-C per g TS or OM per day
Maturity (Seeding Bioassay) Percent emergence Relative seedling vigor	 % (average) % (average)
Select Pathogens	PASS/FAIL (Per US-EPA, 40 CFR § 503.32(a))
Trace metals	PASS/FAIL (Per US-EPA, 40 CFR § 503.13, Table 3)

2021 Western Nutrient Conference

The 2021 WERA-103 (Western Extension/Education and Research Activities) Virtual Western Nutrient Management conference was held March 2-4, 2021. The goal of the conference is to facilitate sharing of soil fertility and nutrient management research information and fertilizer industry developments in Western region. The Conference organizer was Dr. Amber Moore of Oregon State University. Sessions over the three days included: recycled and repurposed nutrient sources; nutrient management of agronomic crops; organic amendments, cover crops and soil health; soil fertility and soil health testing; manure and compost management; nutrient management of horticultural crops; liming and soil acidity and fertilizer evaluations. The 2021 WERA-103 conference had a total of 44 oral and poster presentations, 127 registrants and provided $2900 in student awards. More information on the conference program, access to the conference abstracts and prior years programs can be found at: www.westernnutrientmangement.org.

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WERA-103 2021 Leadership Award

Rob Mikkelsen is the recipient of the WERA-103 2021 Leadership Award. Rob has served in a variety of professional positions, beginning with the Tennessee Valley Authority National Fertilizer Center, in the Soil Science Department of North Carolina State University, as the Vice President of the International Plant Nutrition Institute, the Communications Director for the new African Plant Nutrition institute, and in February returning to California to serve as Director of Agronomy for Yara International.

Rob is a native of California, obtaining his B.S in Agronomy at BYU and his Ph.D. in Soil Science at the University of California. He observed early in his career that so many challenges in agriculture are caused by a lack of understanding the scientific principles. Consequently, he has spent much of his career writing, teaching, and training practitioners how to apply the principles of nutrient management. His team at IPNI were the developers of the 4R principles of nutrient stewardship that are now taught around the world.

Rob has been a long-time supporter of the WERA 103 group and the Western Nutrient Management Conference. He has served in multiple leadership positions in these two groups and was the liaison for many of the conferences that were organized and hosted by IPNI.

Rob has been active in professional societies and received recognition for his service from the Soil Science Society of America, the Agronomy Society, the Outstanding Industry Scientist award from the American Society of Horticultural Science, the Fluid Fertilizer Foundation, and SPAC president 2014-2016 and organized the 14th ISSPA in Hawaii in 2015. He has served on multiple journal editorial boards and has coordinated the publication of several books on nutrient-related topics, including the newly released Springer book on Improvements in potassium recommendations for agricultural crops. He has organized national and international scientific conferences on a variety of topics.

Rob's most recent adventure was in Marrakech, Morocco where he was asked to help start a new non-profit organization to assist African farmers improve their nutrient management practices and heal from the devastating effects of degraded soils. In 2020, Rob returned to Merced, California in the role of Director of Agronomy for Yara International where is he assists with their research and educational projects in Western North America.

Kuo Testing, New Laboratory Facility

Kuo Testing Labs (KTL) is located in Othello, Washington servicing clients in the pacific northwest and western US. After being in a building originally designed as a woodshop for 25 years, KTL decided it was time for an upgrade. In a matter of fortunate timing KTL was able purchased a nearby former local thrift. Originally built in the 1950's, the building was ripped down to the bare studs, space redesigned and built back up into a new laboratory. The facility is approximately 9000 square feet with roughly 7000 square feet of lab space with new hoods, benches and cabinets. The new facility opened in fall 2020 and KTL is excited to test it out with the upcoming growing season.

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Calendar of Events for 2021 - 2023

June 6-10, 2021. Canadian Society of Soil Science Annual Meeting. Charlottetown, PEI, Canada. *(rescheduled from 2020)*

June 2021, TBA. Joint Meeting of Soil Regional Workgroups, SERA-6 NEC-67 and NCERA-13. Clemson, SC, USA. *(rescheduled from 2020).*

August 3-4, 2021. Info Ag. St Louis, MO, USA.

August 30, 2021. Agricultural Laboratory Trade Association (ALTA) Summer Meeting Decatur, IL, USA.

November 7-10, 2021, Soil Science Society of America Meeting, Salt Lake City, UT, USA.

November 2021, TBA. North Central Soil Fertility Meetings. Des Moines, IA, USA.

March 2022, TBA. Great Plains Soil Fertility Conference. Denver, CO, USA.

November 6-9, 2022. Soil Science Society of America Meeting, Baltimore, MD, USA.

March 2023, International Symposium on Soil and Plant Analysis, Chile *(Tentative schedule)*