SOIL SCIENCE SOCIETY OF SOUTH AFRICA

NEWSLETTER
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May 2014

SSSSA COUNCIL/*GVSA RAAD*: 2013-15

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The SSSSA does not necessarily agree with opinions expressed in this newsletter.
Die GVSA onderskryf nie noodwendig die menings van bydraes tot sy nuusbrief nie.

MESSAGE FROM THE PRESIDENT/
BOODSKAP VAN DIE PRESIDENT

Dear colleagues/*Beste kollegas*,

Soil science, to a large extent, serves other sciences like crop production in agriculture, and botany and hydrology in the natural sciences. The result is that "land management", "food security", "ecohydrology", etc are more often in the limelight and don't spell out the importance of soil in global health. It is therefore significant that the United Nations creates awareness of the importance of soil in global health, including human health.

Grondkunde dien ander dissiplines soos gewasproduksie in landbou, en plantkunde en hidrologie in die natuurlike wetenskappe. Die resultaat is dat "grondbestuur", "voedsel sekuriteit", "ekohidrologie", ens meer gereeld in die kalklig kom en die belang van grond nie uitgespel word nie. Dit is dus betekenisvol dat die Vereenigde Nasies deelneem aan bewusmaking van die belangrikheid van grond in die welwese van die aarde, insluitend menslike welstand.

Several exciting high-profile opportunities, with the joint aim of promoting soil science as an important role player, are coming up. The SSSSA turns 60 this year, an annual World Soil Day is declared for the 5th December and a UN Year of Soils for 2015!!

Verskeie besondere geleenthede van hoë blootstelling, met gemeenskaplike doel, naamlik om grondkunde as rolspeler te bemark, is voor die deur. Dit GVSA is vanjaar 60, die jaarlikse Wêreld Grond-dag is op die 5e Desember en 2015 is die VN se Jaar van Gronde!!

On the 2nd December 2013, under Agenda item 25, the United Nations General Assembly declared the 5th of December an annual World Soil Day and 2015 the International Year of Soils. "Noting that soils constitute the foundation for agricultural development, essential ecosystem functions and food security and hence are key to sustaining life on Earth…." And "Noting that the World Soil Day and the International Year of Soils can contribute to raising awareness …..particularly in Africa, to observe World Soil Day and the International Year of Soils, as appropriate;…" and "Recognizing the economic and social significance of good land management…" Please ride the wave created by the UN and our pioneers.

Here are two links that you might be interested in:

http://weatherfarm.com/2013/12/scientists-celebrate-soil/

http://www.fao.org/globalsoilpartnership/world-soil-day/en/

Op 2 Desember 2013, onder Agendapunt 25, het die Verenigde Nasies se Algemene Vergadering die 5e Desember elke jaar Wêreld Grond-dag verklaar en 2015 die Internasionale Jaar van Gronde. "Noting that soils constitute the foundation for agricultural development, essential ecosystem functions and food security and hence are key to sustaining life on Earth…." *En* "Noting that the World Soil Day and the International Year of Soils can contribute to raising awareness …..particularly in Africa, to observe World Soil Day and the International Year of Soils, as appropriate;…" *en* "Recognizing the economic and social significance of good land management…" *Ry asseblief die golf wat deur die VN en ons pioniers geskep is.*

Hier is twee skakels waarin u dalk sal belangstel:

http://weatherfarm.com/2013/12/scientists-celebrate-soil/

http://www.fao.org/globalsoilpartnership/world-soil-day/en/

The SSSSA shirt project driven by Ruth Rhodes was well received. Thanks Ruth, it made a difference at the congress, and still does.

Die GVSA hempprojek wat deur Ruth Rhodes gedryf is, gaan goed af. Dankie Ruth, dit het 'n verskil gemaak by die congress en doen dit nog steeds.

Best wishes/*Groete,*

Pieter le Roux
(051 401 2386; **LeRouxPA@ufs.ac.za**)

EDITORIAL/*REDAKSIONEEL*

May 2014 is the 90th anniversary of the founding of the International Society of Soil Science (ISSS, now IUSS). Hopefully the SSSSA members who will be attending the upcoming World Congress of Soil Science in South Korea will pick up some ways in which our Society can benefit.

In addition, the UN has declared that 2015 will officially be the "Year of Soils". This should help to place soils firmly in the forefront of public consciousness and raise awareness of how fragile our soils really are.

Finally, I again want to appeal to members to send me any contributions for the newsletter. These can be travel reports, interesting soil-related photos, courses and workshops, or notes on research. Remember, over 300 soil scientists read this newsletter, so there is always the chance that one or more of them will know something about your research and be able to offer advice, contacts or suggestions. That's what networking is all about.

Regards,

Garry Paterson
(012 310-2601; 083 556 2458; garry@arc.agric.za)

COUNCIL MATTERS/*RAADSAANGELEENTHEDE*

New Members: we welcome the following new SSSSA members:

Full Members:
LB Motsoko, TL Johnson, CNS Engoke, AK Abderoof, K Kūther, A Meldal-Johnsen, P Chivenge, M Machedi, T Mdlambuzi, IP van der Westhuizen, PB Chauke, AT Grundling, JP Potgieter, A du Toit, G Fanourakis, HA Mupambwa, K Koetlisi, PS Vermaak, B Mtshawu, C Mubekaphi, M Manera

Our membership is currently at 330.

APPOINTMENTS/*AANSTELLINGS*

Dr Raphael Kutu (right) has been appointed as the Research Team Manager for the *Soil Health and Remediation* Programme at ARC-ISCW in Pretoria. He was previously at the University of Limpopo, and before that at ARC-GCI. Raphael replaces Dr Hendrik Smith, who joined Grain South Africa in 2012.

Dr Jay le Roux had been acting as *Soil Health and Remediation* Programme Manager at ARC-ISCW in the interim, but has now accepted a post as Lecturer in the Geography Department at the University of the Free State, where he starts on July 1st.

DEGREES AWARDED/*GRADE TOEGEKEN*

At the April 15th graduation ceremony of the University of Pretoria, two SSSSA members were awarded PhD degrees.

Dr Garry Paterson, from ARC-ISCW in Pretoria, was awarded the degree for his thesis entitled "***The use of palm leaf mats in soil erosion control***", which investigated the effectiveness of using woven mats, made from the fronds of the Lala palm, as a surface covering to combat removal of topsoil. Firstly using rainfall simulator studies, followed by several seasons of field trials at experimental sites in four provinces, the research quantifiably showed that the mats were successful in stabilising the soil surface, slowing down run-off and reducing sediment load, even in relatively harsh conditions. It is hoped that the findings will significantly contribute to soil erosion control and environmental stability in many susceptible areas of South Africa. Enquiries: garry@arc.agric.za

Dr Gerhard Nortje, from the SA Citrus Producers Organization in Tzaneen, was awarded the degree for his thesis entitled "***The impacts of off-road driving and influence of tourists' consciousness and attitudes on soil compaction and associated vegetation in the Makuleke Contractual Area, Kruger National Park***", which studied the impact of permitted off-road driving by game drive vehicles on soils and vegetation in a concession area in the KNP. It also studied the influence of the perceptions and attitudes on the practising of off-road driving in a game park, showing the negative impacts of off-road driving and the very slow recovery after the damage done, causing it to be an unsustainable practice. It also found that the egocentric attitudes of tourists showed that the tourists' education alone will not reduce the demand for off-road driving, which will have to be controlled by means of appropriate regulations that are strictly enforced. Enquiries: Gerhard@subtrop.co.za

And in Canada:

Dr Althea Grundling, from ARC-ISCW in Pretoria, obtained her Doctor of Philosophy degree in Geography at the University of Waterloo, Ontario, Canada on 30 April 2014. Her PhD thesis title is: "Remote sensing and biophysical monitoring of vegetation, terrain attributes and hydrology to map, characterise and classify wetlands of the Maputaland Coastal Plain". Consequently this multi-disciplinary research attempted to determine spatial and temporal changes in the distribution of these wetlands, their susceptibility to human development, understand the landscape processes and characterise and classify the different wetland types. A conceptual model was used to account for the available data, and output from a hydrology model was used to support the interpretation of wetland distribution and function. This research study has made a useful contribution in characterising and classifying wetland type and distribution for a high priority wetland conservation area in South Africa. Enquiries: althea@arc.agric.za

SOIL SCIENTISTS ABROAD/*GRONDKUNDIGES OORSEE*

Michael van der Laan, John Annandale *and* ***Martin Steyn*** *from the University of Pretoria, along with* ***Colin Everson*** *from the University of KwaZulu-Natal, attended a COsmic-ray Soil Moisture Observing System (COSMOS) Workshop held at the Helmholtz Centre for Environmental Research in Leipzig, Germany, from 5-8 May. While the idea of measuring neutrons or the sensors to do so is not new, improved understanding of cosmic-ray neutron interactions at the ground-atmosphere interface, most importantly interactions with hydrogen atoms, has seen the recent, very promising application of this technology in the measurement of soil water content. In a nutshell, primary cosmic rays from space generate cascades of high-energy neutrons in the Earth's atmosphere, which in turn generate fast neutrons after entering the soil. Some of these fast neutrons escape back into the air, with the amount escaping being measurable and correlated to the soil water content of the surrounding area at a scale of approximately 30-40 hectares.*

Extensive COSMOS probe networks are currently being established in the USA, UK and Europe. While these probes do not come cheap, through funding from a USAID National Science foundation PEER award at UKZN's Centre for Water Resources Research and the National Research Foundation's Research Infrastructure Support Programme at the University of Pretoria, South Africa has managed to secure seven COSMOS probes. Three have already been deployed in Cathedral Peak (Drakensberg), Baynesfield Estate (KZN, dryland agriculture) and Lichtenburg (North West) in a pivot under potato production.

***Photo:** One of the COSMOS probes set up in Lichtenburg*

The technology has some potential shortcomings and requires further research to fully appreciate its functioning and applications. For example, as with conventional neutron probes, the wetter the soil, the smaller the measurement volume, in this case, the shallower the probe's measurement depth. South African scientists and postgraduate students now have the opportunity to contribute to the understanding of this exciting technology, including

applications such as flood forecast warnings, irrigation scheduling and the estimation of above-ground biomass and soil water content on a scale between point sampling and that usually considered with satellite imagery.

The team also visited the Schäfertal Catchment in eastern Germany containing state of the art equipment to better understand hillslope hydrology, nutrient leaching, and the impact of climate change on soil processes among other things.

***Photo**: John Annandale, Colin Everson and Martin Steyn taking in some of Lepizig's sights…and tastes!*

CONGRESSES/*KONGRESSE*

COMBINED CONGRESS

The next Combined Congress will most likely be in the Western Cape, with a strong possibility that it will be held in the George area. Once arrangements are confirmed, members will be informed. For general information, please go to the Combined Congress website (www.combinedcongress.org.za).

20WCSS Conference

20th World Congress of Soil Science will be held on Jeju Island, South Korea, from June 8th to 13th, 2014. The theme of the conference is "Soils Embrace Life and Universe", and the congress is also a celebration of 90 years of the IUSS. The website of the 20th World Congress of Soil Science (WCSS) is **www.20wcss.org** and you will find valuable information and announcements by the Organizing Committee. For further information see **www.20wcss.org** or e-mail **wcss@20wcss.org**

MISCELLANEOUS/*ALGEMEEN*

The photo on the next page was taken on 11th July 1981 at Fort Hare University – Alice, Ciskei, the day after the East London Soils Congress.

Top row: Robert Bruce, Marius Du Plessis, Spine van Niekerk, Reg Loxton, ????, Jan Lambrechts, Martin Fey, ?????, Bennie Schloms and Derek Scotney.

Middle row; ????, Koos Eloff, Allen Bennie, Jan Schoeman, Dave Turner, Theo Dohse, Malcolm Hensley, Chris MacVicar (with tie), Theo van Rooyen and Max Hartman.

Front row: Giel Laker, Eben Verster, Freddie Ellis, Frank Merryweather, Denham Grey and Rob Fitzpatrick.

If any of our (presumably older) members recognize the people who are not identified, please contact the editor.

NEWS FROM NORTH WEST UNIVERSITY

Mining and the Environment - Course

Presenter

Prof Ronald Cohen, Colorado, USA

Course Description

This course includes coverage of the environmental problems and solutions associated with each aspect of the mining and ore-dressing process. Mining is a technical and complicated process that differs according to the type of mineral sought. The mining process can be divided into four categories:• site development, extraction,• processing, and site closure.

Procedures for hard rock metals mining, coal mining, underground and surface mining, and *in situ* mining will be addressed relative to environmental impacts. Beneficiation or purification of metals will be discussed, with emphasis on cyanide and gold topics.

Course lectures comprise:

- mining processes,
- environmental problems generated, and
- acid mine drainage.

It is critical to examine the mining and ore-dressing (beneficiation) processes in order to understand the environmental impact in terms of source and contaminant generation pathways. With this knowledge, attempts can be made to mitigate problems, using both conventional and innovative solutions to address the major problems. The course includes readings associated with each topic as well as sets of questions which will serve as take-home quizzes on the readings.

Who should attend?

• Students in mining engineering, geography, geology, environmental science and engineering programmes interested in the impact and management of mining related processes and materials.
• Senior managers in any field dealing with contamination of the environment by mining processes or materials.
• Other levels of management that must deal with contamination issues similar to the above-mentioned.
• Regulators responsible for radioactive contamination of land and water.

Contact Mr Piet van Deventer (**piet.vandeventer@nwu.ac.za**)

Promoting sustainable soil management globally under the Global Soil Partnership

The Global Soil Partnership (GSP), which was launched by the FAO and a group of partners, is based on five (5) pillars of action, the first of which aims to "Promote sustainable management of soils resources for soil protection, conservation and sustainable productivity". A plan of action for the global implementation of this pillar was developed by an international working group of 17 (mainly soil) scientists.

In this plan of action, sustainable soil management (SSM) was defined as "Management practices that protect soil and enhance its performance for the production of goods and provision of ecosystem services without degrading or impairing on- or off-site ecosystem functions". The promotion of SSM is considered essential to contribute to four primary global requirements of 1) maintaining soil functions and ecosystem services, 2) sustaining long term food security, 3) climate change mitigation and adaptation, and 4) maintaining soil biodiversity. To achieve this, the challenges and priorities for SSM implementation need to be identified in all land uses and directly addressed in implementation phases. SSM implementation needs to be increased and implementation efforts should be coordinated and monitored to measure its implementation within the GSP. Extended education, awareness and extension is necessary to further promote SSM at various levels of implementation and decision making, targeting a wide audience. In addition, policies and actions are considered essential to further create an enabling environment for promoting SSM and increasing its implementation. The GSP will link with existing initiatives to place greater emphasis on soils and their protection, as well as to act as a source of expert advice to related global initiatives.

The Draft plan of action for Pillar 1 was presented by the working group chair, **Ms Liesl Wiese** (ARC-ISCW Researcher), for endorsement by the GSP Intergovernmental Technical Panel on Soils (ITPS) during its second meeting held from 7 to 11 April 2014 at the FAO headquarters in Rome. The Panel requested the review of its comments and suggestions and a revised version of the plan of action was subsequently endorsed on Friday 11 April.

A copy of the ITPS Session report, as well as the endorsed plans of action, can be downloaded at:

http://www.fao.org/fileadmin/user_upload/GSP/docs/ITPS_Pillars/ITPS_II_14_FINAL.pdf

The endorsed plan of action will next be presented to the GSP Plenary Assembly to be held from 22-24 July 2014 in Rome for its final endorsement. Pending its endorsement, GSP regions will develop implementation plans to address the recommendations made in this plan of action.

For more information on the Global Soil Partnership, please visit the website at:

http://www.fao.org/globalsoilpartnership/en/

PRECISION FARMING/*PRESISIEBOERDERY*

Geagte Boere en Belangstellendes

Na ons baie suksesvolle aanbieding van die Presisie Boerdery Kongres in 2013, bied ons vanjaar 'n unieke boerdedag aan wat gaan fokus op die spesifieke behoeftes van boere betrokke in presisieboerdery.

Die boeredag vind plaas op 7 Augustus 2014 te Noordwes Universiteit Potchefstroom Kampus. Daar is slegs 300 plekke beskikbaar.

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Soil Bioremediation Workshop

A workshop on various aspects of soil bioremediation was held on 27th and 28th May at ARC Central Office in Hatfield, Pretoria. The workshop was organized by the Soil Microbiology Unit at ARC-ISCW and featured local and international speakers, as well as a special session on Next Generation ("NextGen") Sequencing.

The workshop was attended by around 60 interested delegates and was a great success in bringing together a variety of specialists. If anyone is interested, or would like to discuss any aspects of bioremediation, contact the organizer, Dr Rasheed Adeleke (AdelekeR@arc.agric.za; 012 310 2519).

New Publications

GlobalSoilMap: Basis of the Global Spatial Soil Information System. Edited by D. Arrouays, N. McKenzie, J. Hempel, A.R. de Forges, A. McBratney. 2014. CRC Press. ISBN: 978-1-138-00119-0. Hardcover 494 pages. Price $189.95. GlobalSoilMap: Basis of the global spatial soil information system contains contributions that were presented at the 1st GlobalSoilMap conference, held 7-9 October 2013 in Orléans, France. These contributions demonstrate the latest developments in the GlobalSoilMap project and digital soil mapping technology for which the ultimate aim is to produce a high-resolution digital spatial soil information system of selected soil properties and their uncertainties for the entire world. GlobalSoilMap: Basis of the global spatial soil information system aims to stimulate capacity building and new incentives to develop full GlobalSoilMap products in all parts of the world.

Soil Carbon. Edited by A. E. Hartemink, K. McSweeney. Springer. Progress in Soil Science Series. 2014. ISBN: 978-3-319-04083-7. Hardcover 560 pp. Price $179.00. Few topics cut across the soil science discipline wider than research on soil carbon. This book contains 48 chapters that focus on novel and exciting aspects of soil carbon research from all over the world. It includes review papers by global leaders in soil carbon research, and the book ends with a list and discussion of global soil carbon research priorities. Chapters are loosely grouped in four sections: Soil carbon in space and time, Soil carbon properties and processes, Soil use and carbon management, and Soil carbon and the environment. A wide variety of topics is included: soil carbon modeling, measurement, monitoring, microbial dynamics, soil carbon management, and 12 chapters focus on national or regional soil carbon stock assessments. The book provides up-to-date information for researchers interested in soil carbon in relation to climate change, and to researchers that are interested in soil carbon for the maintenance of soil quality and fertility. Papers in this book were presented at the IUSS Global Soil C Conference that was held at the University of Wisconsin-Madison, USA.

NEWS FROM STELLENBOSCH

The 2014 academic year at the Department of Soil Science, Stellenbosch University got off to a busy start. One of the highlights was the hosting of the Soil Information workshop where parties that generate and utilise soil data were brought together in order to establish a framework through which soil data can be captured, stored and shared. The workshop was a great success and a draft resolution has been drawn up outlining the way forward for soil data capture and dissemination.

Photo: *Workshop participants*

On the academic front a bumper crop of postgraduate students received degrees at the March 2014 graduation ceremony with one PhD student and five MSc students graduating. Of the five MSc students three (Cou Pienaar, Adrian Adams and Jacques Smith) passed with distinction. The future for soil science looks bright at Maties with 22 soil science majors currently enrolled in 3rd year. If these students progress to their 4th and final year we will set a new record, with our largest class to date being 12 in 2009. Two of our postgraduate students (Naude Smith and Jacques Smith) received SSSSA awards for their research papers presented at the annual Combined Congress held in Grahamstown in January 2014.

We have a number of exciting research projects currently on the go. **Ailsa Hardie** and her students are breaking ground determining the fertility requirements for Rooibos tea production; understanding the effect of tillage and crop rotation on soil carbon sequestration in the Swartland; looking at the interactions of mineral nitrogen with biochars; and looking at the effect of fertilizers on compost decomposition dynamics. **Willem de Clercq** is having great success in increasing the yields of subsistence farmers with his Eau4Food Project in Giyani. He

is also involved in the SASSCAL research (www.sasscal.org) where the focus is on continued hydrological and soils research related to climate change in catchments that have been monitored over the past 20 years. **Andrei Rozanov** and his students are establishing soil C distribution patterns in the KZN Mvoti catchment. **Eduard Hoffman** and his students are uncovering the truth about conservation tillage in the Western Cape, while **Cathy Clarke** and her students are tackling the sticky issue on the classification of red and yellow apedal soils with bleached topsoils. More details of these and other research projects can be found on our website (www.sun.ac.za/soil)

The department has also established a new 3-year EU FP7-IRSES Ecodry Project: Sharing best agroecological practises for resilient production systems in dryland and drought conditions. This joint exchange project aims to enhance understanding and share knowledge on strategies to build the resilience of farming systems to natural and man-made impacts in dryland and drought situations. Other participating institutions in this project include: Coventry University, UK; University of Extremadura, Spain; University of Yucatan, Mexico; and National Centre for Research and Development-Badia Research Programme, Jordan.

Finally, we are very proud of our MSc student, Ian Smuts, who will be representing Team South Africa in the upcoming International Soil Judging competition to be held in South Korea in June. Ian received his undergraduate degree in Chemical Engineering, but saw the light and embarked on an MSc in soil science. Ian has shown an excellent ability to classify soils and together with his team from Free State and North West Universities will fly the South African flag high in Korea.

HUMOUR

I am sure most of you are aware of the dry, somewhat abbreviated announcements that the Captain and flight crew deliver on most domestic and international flights. You know, the "This is your Captain speaking…." Type of message delivered in the same flat, nasal way.

On a recent Kulula flight from Cape Town to Lanseria, however, the crew had obviously been listening to the comedy channel on their radios, as the messages were somewhat different. They included the following:

> *"On your life vest you will find a whistle for attracting attention, as well as a light, so that you can see which species of shark is nibbling on your toes!"*
>
> *"Shortly the cabin crew will come around to collect any rubbish, such as cups, bottles, Justin Bieber CDs and Miley Cyrus videos"*
>
> *"Before you leave the aircraft, please check that you have not left behind any personal belongings, such as your handbag, wallet, cell phone or your wife."*
>
> *"Thank you for flying with Kulula. Please remember that the terminal building is a non-smoking zone, and you are only allowed to smoke in designated areas, or in the premises of our competitors!"*

There might have been more that I didn't catch, but it certainly made for a different kind of flight!

SOIL SCIENCE SOCIETY OF SOUTH AFRICA: MISSION

The SSSSA is a scientific society, which, in the interest of its members, promotes the advancement of soil science and soil technology as well as the responsible practising thereof by its members with the view to the long-term sustainable utilization of the environment in the interest of the community.

Aims

1. Promotion and protection of the professional status and prestige of soil science as a science and career.

2. Promotion and extension of the society.

3. Promotion of the standard of training of soil scientists and technologists.

4. Creation of opportunities for the free exchange of ideas on soil science and technology.

5. The obtaining and dissemination of knowledge, information and ideas having relevance to soil science by means of discussion and publication.

6. Promotion of contact between the society and other bodies with common or similar interests, both within South Africa and overseas.

GRONDKUNDEVERENIGING VAN SUID-AFRIKA: MISSIE

Die GVSA is 'n wetenskaplike vereniging wat in belang van sy lede verbind is tot die bevordering van grondkundige wetenskap en tegnologie, en die verantwoordelike beoefening daarvan deur sy lede met die oog op die lang termyn volhoubare benutting van die omgewing in belang van die gemeenskap.

Doelstellings

1. Bevordering en beskerming van die professionele status en aansien van grondkunde as 'n wetenskaplike beroep.

2. Bevordering en uitbouing van die vereniging.

3. Bevordering van die standaard van opleiding van grondkundige wetenskaplikes en -tegnoloë.

4. Skepping van geleenthede vir vrye gedagtewisseling oor grondkundige wetenskap en tegnologie.

5. Die verkryging en verspreiding van kennis, inligting en idees wat op grondkunde betrekking het by wyse van samesprekings en publikasies.

6. Bevordering van skakeling tussen die vereniging en ander liggame met gemeenskaplike of soortgelyke belange, beide in Suid-Afrika en in die buiteland.