

*SOIL SCIENCE  
SOCIETY OF SOUTH  
AFRICA*



**NEWSLETTER**

**No. 102**

**November 2016**

## **SSSSA COUNCIL/GVSA RAAD: 2015-17**

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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,*

I would like to kick off with an issue that worries me a lot. Of the four societies that combine to host the annual Combined Congress, the SSSSA is the second largest in terms of membership. However, over the past few years, SSSSA members have been conspicuous in their absence at the Congress, so that we are often in third place regarding delegates. I would especially like to call on our leaders to attend. If we are not there, who will help to show the younger members the way? We can't just leave them to find out everything for



themselves and we owe it to them to put our knowledge back. If we set an example of non-attendance, it will surely filter down to the next generation. I hope that (both old and young) members will attend the Bela-Bela Congress to contribute to quality discussions during question time and to enrich networking opportunities. Why don't you visit the website now and book your place (<http://combinedcongress.org.za>).

*Ek wil sommer met die deur in die huis val oor 'n saak wat my baie bekommer. Van die vier verenigings wat in 'n vennootskap die jaarliks gekombineerde kongres aanbied is die GVSA die tweede sterkste wat ledetal betref. Die afgelope paar jaar is GVSA lede egter maar skaars by die kongres tot so 'n mate dat ons telkemale die derde plek beklee. Ek wil veral 'n beroep op ons leiers doen om die kongresse by te woon. As ons nie daar is nie - wie gaan die jonger lede tou wys maak? Ons kan hulle nie aan hul self oorlaat nie en is dit aan hulle verskuldig om ons ondervinding terug te ploeg. As ons nou 'n voorbeeld stel van geen bywoning gaan dit verseker deur syfer na die volgende geslag. Ek doen daarom 'n beroep dat ons (oud en jonk) in groot getalle sal opruk na die Bela-Bela kongres om die besprekings tydens vroeë tyd kwaliteits-geleenthede te maak en netwerk geleenthede te verryk. Besoek die kongres se webblad sommer nou om jou plek daar te bespreek (<http://combinedcongress.org.za>).*

Secondly, I would like to encourage you to share the work that you are doing with other soil scientists. One never knows where it will lead. The SSSSA has two platforms available to members for exchange of information, namely this newsletter (contact Garry Paterson at

[garry@arc.agric.za](mailto:garry@arc.agric.za)) as well as our Facebook page (contact Ailsa Hardie-Pieterse at [aghardie@hotmail.com](mailto:aghardie@hotmail.com)).

*Tweedens wil ek u aanmoedig om die resultate van die werk wat u doen met ander grondkundiges te deel. 'n Mens weet nie waartoe dit dalk mag lei nie. Die GVSA het twee platvorms tot die beskikking van sy lede vir die uitruil van inligting. Eerstens hierdie nuusbrieff (kontak vir Garry Paterson by [garry@arc.agric.za](mailto:garry@arc.agric.za)) tweedens ons Facebook blad (kontak vir Ailsa Hardy-Pieterse by [aghardie@hotmail.com](mailto:aghardie@hotmail.com)).*

This will be my last message to you as SSSSA President. I was extremely busy in the last two years, and the Society has had some unique problems to contend with. Some of them are not yet solved as they are more long-term in nature. They will be addressed by my successor, in whom I have full confidence to steer the ship through any rough waters. At the next AGM, to be held during the Congress at Bela-Bela, I will be handing over the reins to Dr Cobus Botha of the ARC at Glen. I want to wish him and the new Council all the best. At the same time, I would like to express my heartfelt thanks to those who served with me on the Council (see the information page of this newsletter) for their hard work and loyal support. It was great teamwork! I hope to see you at the Congress.

*Hierdie is my laaste boodskap aan u as President van die Grondkondevereniging van Suid-Afrika. Ek was die afgelope twee jaar ongelooflik besig en die GVSA het unieke probleme gehad om te oorbrug. Sommige probleme is nog nie opgelos nie omdat dit 'n meer lang termyn geaardheid het. Dié sal deur my opvolger gehanteer word in wie ek volle vertrouwe het om hierdie skip deur enige rowwe waters te stuur. By die GVSA se algemene jaar vergadering wat op die komende kongres by Bela Bela sal plaasvind, sal Dr Cobus Botha van die LNR op Glen die leisels by my oorneem. Ek wens hom en sy raad net die beste toe. Terselfdertyd wil ek die wat saam met my op die raad gedien het (sien die inligtings blad van hierdie nuusbrieff) van harte bedank vir die harde werk en lojale ondersteuning. Dit was voorwaar span werk! Hoop om jou by die kongres te sien.*

Best wishes/Groete,

**Rianto van Antwerpen**

(031 508 7400; [Rianto.vanAntwerpen@sugar.org.za](mailto:Rianto.vanAntwerpen@sugar.org.za))

## **EDITORIAL/REDAKSIONEEL**

In most areas of life, change is inevitable, and the more one tries to fight it, the faster it seems to happen. Those of us who remember the days of the typewriter, overhead transparency sheets, foolscap paper and mental arithmetic sometimes marvel at the modern world where the internet, smart phones, GPS/GIS and many other “new” developments make life both easier and more pressured at the same time.



Despite such progress, however, the important things in life remain, and the precious soil resource that sustains all of us still needs to be researched, and protected for future generations. To this end, it is gratifying that the proposed “Preservation and Development of Agricultural Land” Bill is gathering momentum. It has been circulated for public participation, as well as to get provincial and national feedback, and the comments are being consolidated as I write. One of the proposed results of the Bill (hopefully eventually an Act) will be that municipal bodies will need to take agricultural land into consideration for all development initiatives and that an “Agricultural Ecosystem Report”, compiled by a SACNASP-registered scientist, will be required. One hopes that this step, if and when it becomes law, will help to ensure that as far as possible, valuable agricultural soil will be retained for food production.

Regards,

**Garry Paterson**

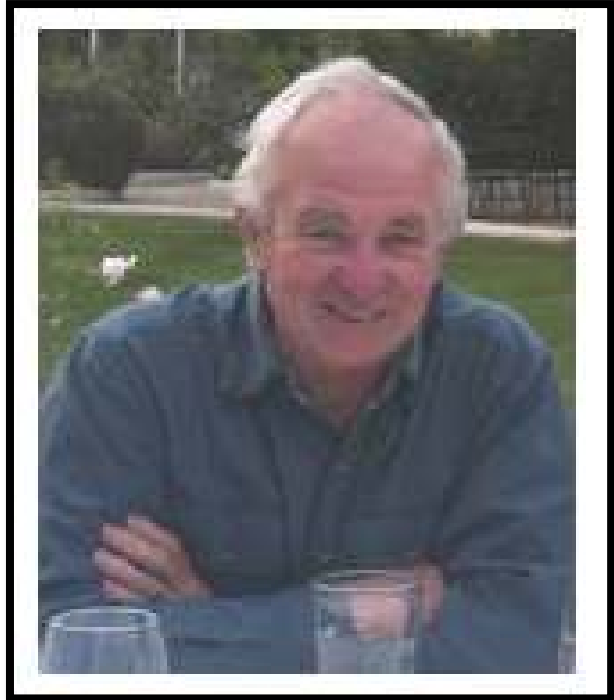
(012 310 2601; 083 556 2458; [garry@arc.agric.za](mailto:garry@arc.agric.za))

## **COUNCIL MATTERS/RAADSAANGELENTHED**

As was previously communicated to members, there have been problems in getting the SSSSA (and other societies) registered on the Central Treasury database, so that to date no SSSSA fees have been received from members employed by Government. While this is an unfortunate situation, the Society would like to request that any members in this situation help the Society by paying their fees in the meantime. This will help us to improve our financial position, which will also help when it comes to Congress income. Council would like to sincerely thank all members who assist us in this way.

## ***IN MEMORIUM***

**Anthony Meldal-Johnsen** has passed away. Anthony was born in East London in 1948 and after attending Selborne College, he obtained his BSc (Agric) in 1971 and MSc (Agric) in 1975, both from the University of Natal at Pietermaritzburg. He had a long and varied career, including working at the pineapple research station at Bathurst, a spell at the Transvaal Region of the Department of Agriculture and then various jobs in the private sector of the agricultural field, including Kanhym, Anglo American, and Tongaat Hulett.



In 1983 he started his own consulting business, and was responsible for more than 250 surveys for agricultural production, mainly in the Eastern Cape and KwaZulu-Natal. He was also latterly a member of the Soil Classification Working Group, helping to prepare the next edition of the classification book.

The SSSSA would like to extend its sympathy to his wife Ursula as well as their daughters and families.

The SSSSA would also like to extend its sympathy to former Society President **Dr Chris MacVicar** on the loss of his wife Alwena. Chris suffered a stroke earlier this year, and our thoughts are with him at this difficult time.

## **MOVEMENTS/BEWEGINGS**

Prof Isaiah Wakindiki has left ARC-ISCW, where he was the Research Team Manager: Soil Science, to take up the position of Research Professor in the School of Agriculture at the University of Venda, in Thohoyandou.

## **SOIL SCIENTISTS ABROAD/GRONDKUNDIGES OORSEE**

SSSSA Council member **Liesl Wiese** has been working in Rome for the FAO for the past few months. Liesl has been involved in soil carbon-related projects, as well as with the Global Soil Partnership initiative. We are sure that she will use her experiences well if and when she ever gets back to South Africa!

## **AWARDS/TOEKENNINGS**

After a year's absence, the SSSSA once again made prize money available for awards at this year's Eskom Expo for Young Scientists, and Garry Paterson, Michael Kidson and Nicky Mushia visited the Birchwood Hotel in Kempton Park on 5<sup>th</sup> October to do the adjudication. As usual, there was a wide variety of fascinating projects, and the adjudicators eventually decided on a junior winner and two (shared) senior winners, whose photos are shown below.

The junior award went to Katelyn van der Merwe, from Newton Primary School in Kimberley, for her project "*Hydrogel to the Rescue*", while the senior award was shared between Sashen Naidoo, from Star College in Durban ("*Eco-tech watering*") and Mieke Oosthuizen, from Duineveld High School, Kuruman ("*Diapers create super soil*").

Congratulations to all the winners, and here's hoping the SSSSA will be able to again sponsor awards next year.

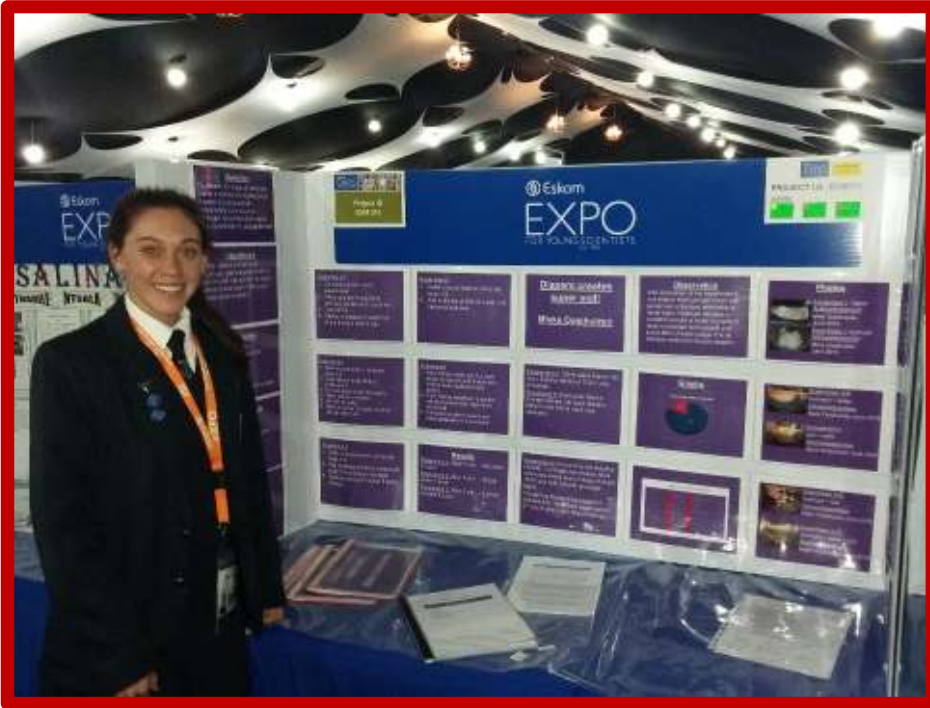


***Katelyn van der Merwe*** (Junior winner)



***Sashen Naidoo*** (joint Senior winner)





**Mieke Oosthuizen** (joint Senior winner)

## **CONGRESSES/KONGRESSE**

### **COMBINED CONGRESS**

The next Combined Congress will be held at Klein-Kariba, just outside Bela-Bela (Warmbaths) in Limpopo Province in January 2017. The first, second and third announcements have been sent out and members can get information at [www.combinedcongress.org.za](http://www.combinedcongress.org.za)

## MISCELLANEOUS/ALGEMEEN

### News from SASRI, KZN

The BT1 trial at Mount Edgecombe was established in October 1939 and is the world's oldest sugarcane trial. Since its inception, 5 PhD studies have been completed using the BT1 trial site as a source of data. The latest person to do so is Sandile Mthimkhulu who is now an employee at SASRI. The following is an excerpt of highlights from Sandile's PhD.

- a) The annual application of fertilizer encouraged Ca and Mg removal by the crop from 0-10 cm and leaching from 0-10 cm to 10-20 cm depth by reducing soil pH which potentially led to less stable aggregates at 0-10 cm.*
- b) Nutrient depletion from Vertisols is very slow, so that the treatment receiving no fertilizer is still producing an adequate sugarcane yield (40 t/ha) in comparison with fertilized treatments (83 t/ha) after 75 years.*
- c) The long-term application of nitrogenous fertilizer had a significant acidifying effect on the soil.*
- d) The combination of green cane harvesting with all residues retained (mulching) and nitrogenous fertilizer application had an acceleration effect on soil acidification. Sugarcane residue contains on average 0.5% N and about 12 t/ha residue is produced per crop. Soil acidity is therefore an important parameter to manage under these circumstances.*
- e) Larger amounts of nitrogen and carbon released from soil organic matter decomposition are stored and protected in the stable macroaggregates (0.2-2 mm) in both green cane harvesting with all residues retained (mulching) and burnt treatments.*
- f) Fertilized plots showed higher apparent electrical resistivity compared to the unfertilized treatments.*

Details of these outcomes are summarized in a recent publication:

<http://www.sciencedirect.com/science/article/pii/S0167880916301967>

### European Soil Organic Carbon saturation capacity

This dataset shows the Soil Organic Carbon (SOC) saturation capacity, expressed as the ratio between the actual and the potential SOC stock in each pixel. Values close to 0 indicate a great potential of soil to store more carbon. The actual SOC stock was derived from the Pan-European simulation using the biogeochemical CENTURY model. The associated data can be found in ESDAC: "Pan-European SOC stock of agricultural soils". The potential SOC stock was obtained simulating a grassland land use without nitrogen limitation, since it was considered a good scenario for SOC accumulation. The scenario set-up was analogous to that described in [Lugato et al \(2014b\)](#) for the grassland land use, namely 'AR\_GR\_LUC'. However, to obtain a potential SOC stock, the model was run for 2000 years with repeated actual climate, in order to reach an equilibrium condition. The simulation involved only the agricultural soils, according to the Corine Land Cover. Download the dataset:

<http://esdac.jrc.ec.europa.eu/content/soil-organic-carbon-saturation-capacity>

### Launch of Global Soil Biodiversity Atlas in Australia

The EU Joint Research Centre and the Global Soil Biodiversity Initiative (GSBI) have released the first ever Global Soil Biodiversity Atlas in Australia. The Global Soil Biodiversity Atlas was launched by the Government Authorities in Canberra on Monday 10<sup>th</sup> October 2016. This unique Atlas maps the soil biodiversity of the entire planet providing a detailed analysis of soil organisms and of threats to soil biodiversity as a fundamental component of the Earth's biodiversity. Global food security is dependent on life found beneath our feet: 98% of all global daily calories derive from soil biodiversity. The Atlas provides current solutions for sustainable management of soils for food security, climate regulation and improved human health.

<http://esdac.jrc.ec.europa.eu/event/launch-global-soil-biodiversity-atlas-australia>

### **News from the Western Cape**

*from Cathy Clarke*

**Stellenbosch news:** The Department of Soil Science, Stellenbosch University has two new researchers joining the team, namely **Dr John Simaika**, a conservation ecologist who will focus on water quality and soil health issues, and **Vink Lategan**, who will focus on soil-related issues for the wine industry.

These two new members will strengthen the Department's research efforts in their respective fields. The Department has also hosted an exchange student, **Matthew Fischel**, from Professor Donald Sparks' Environmental Soil Chemistry group at Delaware University, USA. Matthew has been working on the manganiferous soils of Graskop and plans to look at arsenic oxidation by these soils. Finally, **Reckson Mulidzi** has completed the examination of his PhD on the effect of winery wastewater irrigation on soil quality and will graduate in December this year. This brings the number of PhD degrees awarded to ARC-Nietvoorbij employees to two, as **Carolyn Howell** also received her PhD in the March graduation ceremony this year.

The Western Cape Discussion Group held its second meeting in August. Dr Carolyn Howell presented her PhD work on the effect of winery wastewater irrigation on wine quality. The third and final meeting of the year will be combined with SASSO and Agrimotion. People interested in joining the discussion group should e-mail **Cathy Clarke** ([cdowding@sun.ac.za](mailto:cdowding@sun.ac.za)).

## PEAT EXPEDITION

By Althea Grundling

On 29 October a peat expedition was held (in 37°C heat!) to the Kgaswane Mountain Reserve (previously Rustenberg Nature Reserve) located on the northern slopes and summit of the western Magaliesberg mountains, North West Province. The aim was to search for unknown peatland sites. The expedition was led by **Dr Piet-Louis Grundling** (Department of Environmental Affairs, Natural Resource Management: Wetland Programmes) and accompanied by international guests from The Netherlands, ARC researchers (**Dr Althea Grundling** and **Dr Garry Paterson**) and students (**Yonwaba Atyosi** and **Zikona Gqalaqha**). The international guests were board members from the "Ecologiese Research Stichting" (ERA), The Netherlands: **Prof Ab Grootjans** (University of Groningen), **Renée M. Bekker** and **Evert-Jan Lammerts** accompanied by **Roel Strijkstra**, **Baps Snyderwind** and **Rieneke ten Hove**. The ERA foundation has been assisting wetland research in South Africa since 2010, supporting students and strengthening the cooperation with ARC wetland research initiatives, e.g. Vankervelsvlei peatland (Western Cape), Vasi Pan (KZN) and wetland research in the Kruger, Marakele and Mapungubwe National Parks.



***High organic carbon soils directly on hard rock at  $\pm 35$  cm depth***



***The group busy examining one of the peat soil samples***

## Soil Stockpiling Project

ARC-ISCW has recently completed a Coaltech-funded project looking at soil stockpiling on open-cast coal mines. The specific soil properties investigated included physical, chemical and microbiological.

The rationale for the project was that there was a need to look at the specific stockpiling process to try and see if recommendations and improvements could be made before rehabilitation, which may in any case be too late.



### *Poor stockpiling (>20 m high) with soil/spoil mixing and erosion*

The analytical results showed significant deterioration in all soil properties with the stockpiling process. On average, clay content increased by between 50% and 60% for both the topsoil and subsoil, while surface bulk density (compaction-related) increased through the entire chain from stockpiling to rehab. The stockpiled soils were so compacted that penetrometer insertion was not possible, with effective depths on rehab areas being less than 17 cm in most cases. Chemically, CEC values showed only a slight increase compared to clay content, showing the effects of leaching after stripping, while pH values showed a large variation, again due to mixing effects of stockpiling.

Topsoil organic carbon declined by almost half through stockpiling and only showed a slight increase in the rehab soils, while C:N ratios fell across the whole process. Microbiologically, the number of species occurring fell in the stockpiles, along with a decreased ability to solubilize phosphates, to fix nitrogen and to break down organic carbon.

In addition, a pot trial was conducted, where mass samples of stockpiled soil from varying depths were collected and grass grown under four treatments in a glasshouse. None of the soils were able to support grass without any ameliorants or even with only added lime, but when fertilizer was added, there was good vegetative growth. Stockpiled soil from the surface layer, which had the highest CEC and contained higher amounts of organic carbon, was generally better than the two samples collected at depth, but interestingly, when all the soils were mixed, the growth results were better than soils from any one single depth.



### ***Mixed storage of stockpiled soils***

Recommendations from the project include:

- Make sure that the results from the pre-mining soil survey are used effectively
- Ensure that there is participation by a soil scientist in the stripping and stockpiling process to limit unnecessary soil mixing
- Make sure that the stripping and stockpiling is carried out properly
- Limit vehicle traversing as far as possible

- Ensure low stockpile height with no further vehicle disturbance
- Re-use stockpiles within as short a time span as possible
- Obtain soil scientist and vegetation specialist consultation at the rehabilitation phase
- Prepare rehab areas properly and monitor regularly

Three postgraduate theses (one PhD and two MSc) are currently being written. Contact **Garry Paterson** ([garry@arc.agric.za](mailto:garry@arc.agric.za)), the project leader.

A follow-up project, to look at microbiological aspects, is underway, hopefully to build on the results from this study to improve the stockpiling process for ultimately better rehabilitation.

### **“Been there, got the T-shirt”**

As supplied by Prof Giel Laker, the T-shirt says it all.

Prof Giel says he always remembers the quote from famous USDA soil scientist Charles E. Kellogg, “Soil scientists are ignored until it is too late and then they are called in to do a post mortem!”

*(see previous article about soil stockpiling??)*





## HUMOUR

### 1 - Law of Cat Inertia

*A cat at rest will tend to remain at rest, unless acted upon by some outside force - such as the opening of cat food, or a nearby scurrying mouse.*

### 2 - Law of Cat Motion

*A cat will move in a straight line, unless there is a really good reason to change direction.*

### 3 - Law of Cat Magnetism

*All blue blazers and black sweaters attract cat hair in direct proportion to the darkness of the fabric.*

### 4 - Law of Cat Thermodynamics

*Heat flows from a warmer to a cooler body, except in the case of a cat, in which case all heat flows to the cat.*

### 5 - Law of Cat Stretching

*A cat will stretch to a distance proportional to the length of the nap just taken.*

### 6 - Law of Cat Sleeping

*All cats must sleep with people whenever possible, in a position as uncomfortable for the people involved as is possible for the cat.*

### 7 - Law of Cat Elongation

*A cat can make her body long enough to reach just about any counter top that has anything remotely interesting on it.*

### 8 - Law of Dinner Table Attendance

*Cats must attend all meals when anything good is served and all meals anyway, just to check.*

### 9 - Law of Rug Configuration

*No rug may remain in its naturally flat state for very long.*

### 10 - Law of Obedience Resistance

*A cat's resistance varies in proportion to a human's desire for it to do something.*

- 11 - **First Law of Energy Conservation**  
Cats know that energy can neither be created nor destroyed and will, therefore, use as little energy as possible.
- 12 - **Second Law of Energy Conservation**  
Cats also know that energy can only be stored by a lot of napping.
- 13 - **Law of Refrigerator Observation**  
If a cat watches a refrigerator long enough, someone will come along and take out something good to eat.
- 14 - **Law of Electric Blanket Attraction**  
Turn on an electric blanket and a cat will jump onto the bed at close to the speed of light.
- 15 - **Law of Random Comfort Seeking**  
A cat will always seek, and usually take over, the most comfortable spot in any given room.
- 16 - **Law of Bag / Box Occupancy**  
All bags and boxes in a given room must contain a cat within the earliest possible nanosecond.
- 17 - **Law of Cat Embarrassment**  
A cat's irritation rises in direct proportion to its embarrassment times the amount of human laughter.
- 18 - **Law of Furniture Replacement**  
A cat's desire to scratch furniture is directly proportional to the cost of the furniture.
- 19 - **Law of Cat Landing**  
A cat will always land in the softest place possible.
- 20 - **Law of Cat Disinterest**  
A cat's interest level will vary in inverse proportion to the amount of effort a human expends in trying to interest it.
- 21 - **Law of Pill Rejection**  
Any pill given to a cat has the potential energy to reach escape velocity.

## **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.