



Dr Albert Rovira

1999 Prescott medallist

Dr Albert Rovira was presented the J.A. Prescott Medal of Soil Science in a ceremony attended by over 60 people at the Charles Hawker Conference Centre, Adelaide in August. The medal is awarded annually by ASSSI to a person, not necessarily a society member, who has made an outstanding contribution to soil science. The award recognised Dr Rovira's life-time achievement in increasing our understanding of interactions between plant roots and micro-organisms in the rhizosphere. A condensed transcript of his acceptance speech appears on page 5.



ABOVE: Pictured during the presentation of the 1999 Prescott Medal are (L to R) ASSSI Federal President Graham Price, medal recipient Albert Rovira and SA Branch President and also a former Prescott medalist Rob Fitzpatrick.

In this issue

- **Meet treasurer David Lester**
- **Prescott medal address**
- **New *OZ Soils* version released**
- **Update on 2000 Conference**
- **New members galore!**

**AUSTRALIAN SOCIETY OF SOIL SCIENCE INC.
ARBN 080 783 106**

The Australian Society of Soil Science Incorporated (ASSSI) was founded in 1955 to work towards the advancement of soil science in the professional, academic and technical fields. It comprises a Federal Council and seven branches (Qld, NSW, Riverina, ACT, Vic, SA and WA). Liability of members is limited.

Objectives

- To advance soil science
- To provide a link between soil scientists and members of kindred bodies within Australia and in other countries.

Specific Objectives

- To promote the field of soil science
- To further the expertise in soil science of members
- To be a forum for discussion on soil science
- To increase government and community awareness of soil science
- To liaise and cooperate with other organisations in support of mutual interests
- To encourage research and extension in soil science
- To promote wise management of the soil resource throughout Australia

Membership

For all membership and CPSS application and renewals, subscription, queries and address changes contact Alice Bass, ASSSI executive officer on Mon-Tues 10.00am - 4.30pm and Wed 10.00 - 1.30pm. See back page for contact details.

ASSSI Website

<http://asssi.rivercorp.com.au>

PROFILE

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Advertisements

Advertisements relevant to some aspect of soil science are welcome. Charges are full page \$200, half page \$100, quarter page \$50. Information about conferences, soil science courses, scholarships etc is published free.

Cover

Munsell 5YR 4:8

Contents

4 **2000 Conference**

5 **Dr Rovira's Speech**

6 **Treasurer's Profile**

7 **Tri-branch Workshop**

8 **Branch News**

11 **New Members**

12 **Oz Soils 3**

14 **Vale Dick Blackburn**

16 **Leeper Lecture**

18 **Book Review**

20 **China Calling**

22 **Soil Science Scrapbook**

23 **Federal Council Minutes**

26 **Conferences**

27 **Soils Contacts**

All contributions are welcome, text preferably by email. Please send to the editor, Jonnie White, PO Box 936, Biloela Q 4715, tel 07 4992 6041, fax 07 4992 6043, email jrwhite@tpg.com.au



From the president

19th World Congress in Soil Science

Many of our retired members and some close to retirement would remember that Australia hosted the 9th International Congress in Soil Science in Adelaide in 1968. I think Gordon Hallsworth was the President and Chairman of the Organising Committee. Should ASSSI put its hand up for the 19th Congress scheduled for 2010? That question is now under consideration by your Federal Council.

Before such a decision is taken, I would like members to consider the pros and cons of ASSSI hosting such an event, and to express your views directly to branch Presidents or to any Council member or e-mail Alice Bass. A decision does not have to be made for some time, but early feedback would help in the planning. The final decision will be announced at the 17th Congress in Bangkok, Thailand in 2002. The 18th Congress is planned for Seattle, USA for 2006.

Personally, I think it would be a great honour for Australia to host this event. It would lead to great opportunities to "expose the profile" of soil science to the Australian public like never before. It would mean that we would have to choose from amongst our members a person who would be able to devote time and energy and would need to have at least a national and preferably an international reputation within the soil science community, to take on the role of President of IUSS and Chairman of the Congress. In addition we would need to provide a support group to run the international body, IUSS, for 4 years prior to the event.

Just to indicate that there is an external force at work, I have been approached by the Brisbane Convention and Exhibition Centre, with an offer to discuss details of running this event. I have taken up the offer and Steve Raine and I will meet them in mid October. Strangely, their interest came from their representative in Europe.

Thus, this Council will need to make a long term commitment on behalf of ASSSI within the next 12 months, and commit people who may be appropriate to an Organising Committee over a 4 - 8 year period.



From the editor's desk

Well I'm not sure about the rest of the country, but spring came early to Central Queensland - unfortunately it hasn't brought any rain with it. This spring issue of *Profile*, on the other hand, is full of news from around the country.

This issue includes a report from the successful joint ASSSI branch workshop on soilmoisture monitoring held last month at Tatura. Congratulations to the Victorian, Riverina and New South Wales branches on a successful 2 days.

We also get a chance to welcome EIGHTEEN new members from backgrounds as varied as contaminated site remediation to Middle Eastern soil survey! Hats off to those branches extending the benefits of ASSSI membership to new members.

A reminder to everyone sending in contributions - my contact details have changed. You can find the new details on the page opposite. Please make sure you send things on to the right place - I don't want to miss anything!

Looking forward to hearing from you soon,
Jonnie White

MAKE SURE YOU ARE PROTECTED

If you or your branch are organising an event you MUST notify the federal executive, to guarantee insurance cover.

An event is any activity other than ordinary meetings - workshops, training sessions, and ESPECIALLY field trips.

Send an outline of the activities involved, the time, date and venue of the event to:

David Lester

Incitec Ltd, PO Box 623 Toowoomba QLD 4350

tel 07 4639 7403 fax 07 4639 7410

David.Lester@incitec.com.au

Please notify David at least one week before the event.

Well, what do you think? Is it worth pursuing? Is it beyond our capacity? Are there suitable, motivated people with the credentials for such an office? Please write to the Editor or e-mail any member of Council with your thoughts.

Graham Price

NZSSS/ASSSI Conference 2000

The organising committee for the NZSSS/ASSSI 2000 Conference to be held at Lincoln University in New Zealand has reported good progress in arrangements. All ASSSI members will have received an initial flier advertising the conference in *Profile* Issue 118, with a second registration flier to appear in an upcoming issue.

A provisional programme structure has been outlined with plenary, concurrent and poster sessions scheduled for each of the days. Field trips will occur on the third day of the five day programme with two pre-conference tours also planned of the North and South Islands.

Plenary speakers who have accepted invitations to speak at the conference include:

•Professor Ron McLaren, Lincoln University, President NZSSS on *Soil Science: New Horizons for a New Century*

•Graham Price, Incitec Fertilizers, President ASSSI on *Soil Science: New Horizons in Soil*

Fertility Management

•Dr Roger Swift, CSIRO on *The Under-ground Economy: Soil Science's contribution to New Zealand and Australian society*

•Professor Pam Hazleton, University of Technology, Sydney on *Soil Science: an emerging interdisciplinary link*.

The Editorial Board of the Australian Journal of Soil Research have agreed to include these plenary papers in an issue to be pre-published and available at the conference.

Perhaps the most exciting development of the conference arrangements is the inclusion of a plenary session in which four or five young scientists selected from submitted papers will speak. The aim of this session is to highlight new directions in soil science from some of those who will be the future leaders in our discipline.

Visit www.lincoln.ac.nz/cted/nzsss for more information and to register interest.

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Australian Publication wins GK Gilbert award

The prestigious GK Gilbert Award presented by the Geomorphology Specialty Group of the Association of American Geographers for excellence in geomorphic research was this year presented to a team of Australian authors for their publication *Soils: A new global view*. Geoff Humphries accepted the award on behalf of his colleagues Ron Paton and Peter Mitchell, all from Macquarie University's Department of Physical Geography at a ceremony held in March in Honolulu. This was the first time that this award has been granted to researchers from outside the USA.

When presenting the award Anne Chin, Texas A&M University cited RJ Schaetzl who said of the 1995 publication, "only rarely does a book or paper come out that introduces truly new ideas and ways of thinking about the evolution of landscapes...this publication integrates a body of literature and

presents a theoretical construct that will rattle mid-latitude geomorphologists and pedologists to their very being".

The authors have used their experiences on older landscapes to develop new conceptual frameworks for explaining soil-geomorphic landscapes that otherwise appear complicated and difficult to explain. In his acceptance speech Geoff Humphries noted that "the idea of the book hatched in 1986 and took shape slowly". The result he says is "a set of testable ideas framed within a definite viewpoint that differs in important ways from orthodoxy"

Transcripts of the presentation and lighthearted acceptance speeches can be found on the web at www.homepage.montana.edu/~ueswl/geomorphologist/archivesaug99.htm#Geomorphorum

Rhizosphere Microbiology and Dryland Farming Systems - Is there a correlation?

A condensed transcript of Dr Albert Rovira's acceptance speech

The rhizosphere is that zone of soil around plant roots in which the biology and chemistry of the soil are influenced by the root. In my talk I set out to describe the microbiology of the rhizosphere and how this is linked to crop productivity, root health and sustainable dryland farming.

As plant roots grow through soil they release water soluble compounds such as amino acids, sugars and organic acids which are substrates for the millions of microbes in the soil adjacent to the roots. Working together with Ralph Foster, we examined ultra-thin sections of the root soil interface by transmission electron microscopy and demonstrated the variety and numbers of microorganisms associated with roots of wheat and clover. These studies were extended using scanning electron microscopy (SEM) which gives an "aerial" view of the root surface and in this way we observed the mucilaginous layer which covers healthy roots (the mucigel) and its break-up when roots become infected with the take-all fungus (a serious pathogen of wheat).

At this stage of my career I decided to embark upon a field program to assess the relevance of this work to the productivity of wheat in the field. The first step was to assess the impact of the soil biota on yields and this was done by fumigating the soil with methyl bromide. Trials conducted throughout Victoria and SA demonstrated that wheat yields were severely constrained by root diseases (take-all and cereal cyst nematode) and elimination of these diseases by soil fumigation could result in four-fold increases in grain yield.

This work led to the setting up of the long-term rotation x tillage trials at Avon and Kapunda. These sites were chosen because the soils and rainfalls are typical of 80% of the major wheat growing areas of south-eastern Australia. At each site there were 9 rotation and tillage treatments with 6 replicates and a duplicate trial was set up at each site one year later so that each year data on the effects of rotation and tillage on wheat yield could be obtained.

This field-oriented research demonstrated that the first step in changing from conventional farming with multiple cultivations to direct drilling is to reduce the level of root disease by rotation so that water use efficiency can be maximised through a healthy root system. When this was done yields with direct drilled wheat equalled those obtained following cultivation. However, the trials demonstrated that in the Mallee environment there was still one major

biological constraint. A serendipitous finding at Avon was that the root disease "bare patch" caused by the *Rhizoctonia* fungus became a major constraint to the adoption of no-till farming, because, unless the soil is disturbed prior to seeding, the mycelial strands of this fungus which have grown through the soil after the initial autumn rains are viable and attack the roots. Basic research by Stephen Neate had shown how this fungus survived in soil and grew through soil after the opening rains. Stephen had also demonstrated that damage to roots was reduced when the mycelia were broken away from their propagules of particulate organic matter.

This basic research on the ecology of the *Rhizoctonia* fungus led us to look at different sowing points which could break up the fungal hyphae without actually cultivating the soil. With the help of farmers and implement makers we came up with the "narrow sowing point" which penetrates the soil to about 10cm and sows the seed at around 5cm. In this way the fungal strands are broken off from the propagule base from which they are growing and it takes several weeks for them to ramify through the soil by which time the plant has developed some "adult resistance" to the pathogen. This finding brought about a major revolution in sowing point design and now the majority of wheat farmers who practise either direct drilling or minimum cultivation use narrow sowing points.

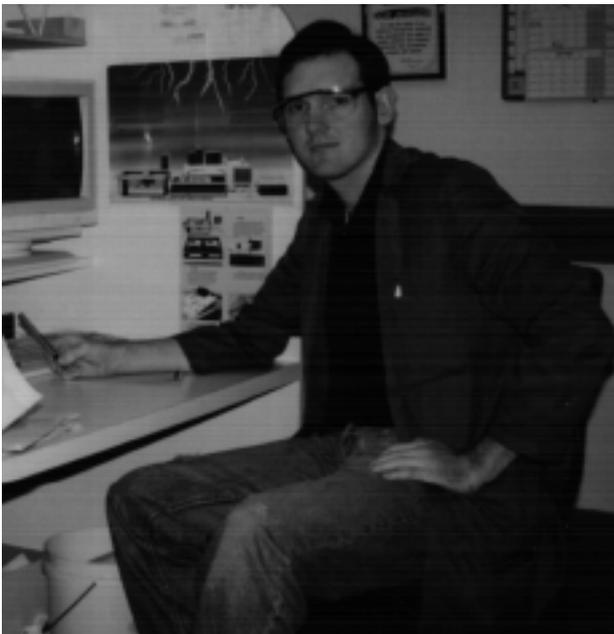
Another piece of serendipity from the Avon trial was the observation that with complete stubble retention for several years both the *Rhizoctonia* fungus and the take-all fungus almost completely disappear from the soil - in other words the soil has become "suppressive". This was confirmed in the glasshouse and laboratory by David Roget using plant bioassay and DNA probe techniques. Research by Bronwyn Wiseman, a CRCLM Ph.D. student, demonstrated that this suppressiveness is biological and not due to chemical or physical soil properties. Subsequent work in CSIRO indicates that the suppression is linked with the carbon and nitrogen cycles in the soil rather than specific biological control organisms.

An important extension of this discovery by CSIRO biologists of the build up of suppression as a result of management is the finding by David Roget that there are several Mallee farmers who, quite independently of the CSIRO work, have developed

continued page 6

David Lester - ASSSI Federal Treasurer

Federal Treasurer, David Lester is also Technical Support Officer with Incitec Fertilizers based in Toowoomba. This issue we get a chance to meet the man behind the cheque book.



ABOVE: David during his time in Incitec's Gibson Island laboratory. These days you are more likely to find David without the lab glasses and sporting a beard.

Rhizosphere Microbiology

from page 5

suppressive soils as a consequence of changing to residue retention and minimum cultivation over several years. This practical confirmation of our findings makes the work more credible to farmers and easier to convince them that there are economically practical means of increasing productivity in the SA, Victorian and NSW Mallee regions while improving the sustainability of their farming systems.

I have emphasised the importance of basic research to give us the understanding necessary for more applied research - something that the politicians and science policy makers need to keep in mind when deciding on science policy. I also make a plea to the bench and field scientists not to ignore the role which serendipity plays in science and also do not be afraid to move out of your comfort (discipline) zone to follow promising leads. After all, no way am I an agricultural engineer but that did not stop the development of the narrow sowing point.

Finally, a word of deepest gratitude to all the staff who worked with me over the years on different phases of my work and a special thanks to Robin and Olive Manley our hosts at Avon.

Albert Rovira, AO, FTSE

Accepting the Federal Treasurer position in January this year, David has continued the work of previous Treasurers, and embraced the task of resolving two important ASSSI issues. These are:

- introducing a system whereby members can pay their subscriptions by credit card
- preparing the society for the taxation system changes that the new GST will bring.

Having previously served as Federal Treasurer to the Australian Soil and Plant Analysis Council (ASPAC), David brings strong industry and treasury experience to the ASSSI position. He was approached by Graham Price in late 1998 to become ASSSI Federal Treasurer, following their work together on the ASPAC Federal executive.

David's career in soil science began at CSIRO Tropical Crops in St. Lucia, Brisbane before he moved to Incitec Fertilizers at Gibson Island, Brisbane as a laboratory technician. He spent two years in the production laboratory at Incitec's manufacturing plant, working mainly in environmental monitoring. During 1993, he started in the Incitec Analysis Systems laboratory, conducting soil, plant tissue and water analysis.

In 1996, David moved to Incitec Head Office and developed the ISO 9002 system for Incitec's Nutrient Advantage interpretation and recommendation package. This was the second ISO system in the world to be certified for the provision of agronomic advice, and the first certified system in Australia. During 1996, David also became a member of the ASPAC laboratory proficiency committee, on which he still serves.

David's career changed again in June 1998 when he transferred to Toowoomba, taking up a position assisting Incitec's broadacre research team. Working with Chris Dowling, Market Development Agronomist, David is involved in Incitec's long-term nutrition experiments, testing fertilizer efficacy, precision agriculture research as well as providing training and technical support services to Incitec staff and dealers.

David holds a Bachelor of Applied Science and a Graduate Diploma of Information Technology from the University of Southern Queensland. He is currently undertaking a Master of Applied Science (Research) through the University of Queensland, Gatton Campus, under the supervision of Dr Col Birch.

How Wet is My Soil?

Robert Edis reports on the recent "tri-branch" workshop on Soil Moisture Monitoring Techniques held at Tatura

A joint workshop was conducted by the Victorian, Riverina and NSW branches of ASSSI, on Soil Moisture Monitoring Techniques. It was held at the Institute of Sustainable Irrigated Agriculture (ISIA), Tatura, in northern Victoria, on 23-24 September 1999, principally organised by Aravind Surapaneni (ISIA), Brendan George (State Forests, NSW) and Robert Edis (Melbourne Uni). The workshop was attended by about 97 people, mostly non-ASSSI members.

Presenters of the various technologies were mostly practitioners rather than salesfolk, and competently discussed the principles, practices, advantages and shortcomings of various instruments.

On the first day, Brendan George laid the foundations of gravimetric and volumetric moisture contents. Kerry Greenwood (ISIA) discussed tensiometry, particularly the puncture tensiometers which save the expense of a gauge on each tensiometer. Kerry described the double puncture technique to get the actual total water potential. Jacinta Corrie (ISIA) built on the potential theme in

discussing gypsum blocks, allowing drier potentials to be measured. Apparently butt diameter is a direct indicator of vigour.

After lunch, Brendan George went through the neutron moderation method. Obviously a well accepted technology, as neutron probes can be picked up at garage sales. Then there were several dielectric-based methods. Robert Edis did the TDR thing, including demonstrations of dielectric behaviour then Brendan introduced the concept of frequency domain (FD) methods. The FD instruments discussed were 'Enviroscan' by Chris Estcourt Hughes (Sentek); 'Aquaflex' by Mark Wood (ISIA), and; 'Gopher' and 'Diviner' by Adrian Orloff (Soil Moisture Monitoring Services).

The next morning was spent in the paddock, looking at all the different machines in their natural habitat, followed by some considerations of scale (Andrew Western, Melbourne Uni), and a revisit of the role of the moisture characteristic in water balance studies (Robert Edis).

In the end, everyone had a nice time, and may have even learnt something.

1999 NON-FINANCIAL MEMBERS

As of the 21st September 1999 the society has the following number of members who have **not yet paid this years subscription**.

Branch	No. Members	No NOT Paid
ACT	79	33
NSW	205	94
QLD	241	100
RIVERINA	48	19
SOUTH AUST.	128	65
VICTORIA	136	58
WEST. AUST.	105	44
INTERNATIONAL	21	10
TOTAL:	963	423

These numbers show that 44% of members have not yet paid for their 1999 ASSSI membership. We would like to remind all those members to please do so soon. You would have received a reminder notice regarding this matter in early September. The society relies on these payments to keep running and to provide its current level of service.

We will have moved those members who have not paid their 1999 subscription by October 15th onto an inactive list and they will receive any correspondence, including the Profile newsletter until their subscription is paid. The society can not afford to keep paying for the production, printing and mailing of the quantity of newsletter at the current rate if members do not pay their annual subscription. Please contact the Executive Officer if you wish to discuss the matter further.

Please ensure you inform me of any changes in address, phone, fax or email. Thanks,

Alice Bass, Executive Officer



Branch news

WESTERN AUSTRALIA

Travellers

Keith Lindbeck (Keith Lindbeck & Associates) attended and prepared a paper for the 16th Annual Meeting (Conference) of the American Society for Surface Mining and Reclamation (ASSMR) held in Scottsdale, Arizona, over the period 13-19 August 1999. The paper was titled "Environmental Management Considerations and Rehabilitation at a Saline Minesite in Arid Western Australia". The paper was presented by Keith's co-author, Ms Celeste Beavis, Environmental Adviser from Sunrise Dam Gold Mine near Laverton WA, operated by Acacia Resources Ltd. While in the USA, Keith also visited mining operations in Nevada and Wyoming.

Conferences

Soils 2000

The Western Australian Branch of the ASSSI holds its conferences every three years. In the year 2000, the conference will be held at the Muresk Institute of Agriculture in the picturesque Avon Valley, approximately 100 kilometres east of Perth. For the first time, the conference will be co-sponsored by the Environmental Consultants Association (WA) Inc. The theme of the conference, which covers all aspects of soil science, will be 'Making Our Science More Useable'.

The conference will commence on 11 July 2000. Papers will be presented in oral and poster sessions over two of the three days. A one day conference tour (12 July) will highlight the role of soil science in obtaining solutions to problems of land management. The tour will include site visits centred on the Avon Valley.

The conference is designed to:

- provide a forum for environmental and soil scientists to present their latest advances or projects
- allow presentation of results from continuing projects
- encourage interaction between soil and environmental scientists, land managers and extension workers
- stimulate the application of soil science to land use and management issues and challenges.

The Organising Committee is calling for papers and expressions of interest to attend the conference. It is anticipated that the registration fee for the two days of presentations and the one day of site visits will cost in the vicinity of \$270. Rates will be provided for those wishing to attend only on particular days. A discount for members of the ASSSI and ECA will apply. A special reduced fee will be available to full-time students.

Authors will be required to provide a title and summary not exceeding 100 words to the organising committee by 31 October 1999. For further information, please contact Dr Mike Wong, phone 08 9333 6299, email m.wong@ccmar.csiro.au.

Fourth WA Symposium on Ions in the Soil-Plant-Water Continuum

Plant nutrition and ion toxicity research in Western Australia has been recognised for its excellence world-wide. Since 1997, a symposium has been conducted each year to enable researchers and students from CSIRO, The University of WA, Murdoch University, Agriculture WA and other organisations to present results of recent developments in their fields of research. The fourth symposium in the series is to be hosted by the Chemistry Centre (WA) on Friday 26 April 2000 with the endorsement of the WA Branch of the ASSSI.

Previous symposia in the series have been hosted by the University of WA, Murdoch University and CSIRO. Topics covered in previous symposia include

- diagnosis of nutrient deficiencies, aluminium and heavy metal toxicities,
- analytical methods, fertiliser technologies, grain quality, soil salinity,
- rehabilitation of disturbed land, nitrogen fixation and soil acidity.

For further information, please contact Dr David Allen, phone 08 9222 3031, email dallen@ccwa.wa.gov.au. Registration fees are expected to be approximately \$20. Attendance by visitors from other states is strongly encouraged.

QUEENSLAND

Effluent Irrigation Course

A two-day effluent irrigation training course organised and conducted by the Department of Natural Resources and the Consortium for Integrated Resource Management (CIRM) was held recently at Cleveland. The course, sponsored by the Natural Heritage Trust, was the third of at least five proposed courses, and provided practical guidance on the use of sewage effluent for land irrigation in a broad range of situations.

Course leader, Ted Gardner, said the lectures were designed for the needs of local authorities, State government and private consultants. The 27 participants at the July 1999 course represented a variety of backgrounds, including the Environmental Protection Agency, private consultants, and local government representatives from most parts of Queensland.

The course addressed a wide range of topics related to effluent irrigation including: land sustainability; irrigation water requirements; policy considerations within the Queensland Government; social issues of effluent reuse; soil suitability for irrigation; human health and pathogen considerations; approval processes in the Queensland Government; and relevant case studies. For the July course, the topic of on-site disposal systems was included in a presentation from Phillip Geary, Lecturer in Geography at the University of Newcastle.

A key component of the workshop was a field inspection of soil profiles and the WC Fields effluent irrigation demonstration site in the grounds of the Redland Shire Council's wastewater treatment plant. An extensive environmental monitoring system has been established at WC Fields to measure the water, nutrient and biomass balances of grass and trees irrigated with sewage effluent of different nitrogen levels.

The next course will be held in early December, with an enrolment limit of 25 to ensure effective interaction between lecturers and participants. For further details, contact Ted Gardner on email gardnet@dnr.qld.gov.au, or Nicole Diatloff on phone 3896 9209, email Nicole.Diatloff@dnr.qld.gov.au.



ABOVE: Andrew Biggs discussing soil profiles at the third effluent irrigation training course

New President

The Queensland Branch is in the process of electing a new president with the imminent departure of current president, Mark Littleboy to take up employment in New South Wales. The Queensland branch members wish Mark well in his future endeavours.

SOUTH AUSTRALIA Seminars and Presentations

University of Adelaide Department of Soil and Water Postgraduate Symposia (presented in September 1999) speakers included:

Elizabeth Drew "The growth and function of external VA mycorrhizal hyphae in compacted soils".

LingLing Gao "Defence responses of an arbuscular mycorrhiza-defective tomato mutant".

Rina Kasiamdari "Interaction between vesicular-arbuscular mycorrhiza and other root-colonising fungi".

Muhammad Nathan "Clay movement in duplex soils of degraded landscape of Mt. Lofty Ranges".

Jon Varcoe "The influence of natural organic matter on the movement of P in soils".

Jason Bobbin "Adapting evolutionary algorithms for knowledge discovery from aquatic ecosystems".

Mardi van der Wielen "Managing water clarity and blue-green algae in floodplain wetlands using constructed inlets."

Li Wen "Water purification functions of natural and constructed wetlands in Reedy Creek".

Akhmad Saisy "Nitrogen mineralisation in Indonesian tropical peatlands".

John Weber "Stabilization of metal contaminated soil through the utilization of biosolids".

In August 1999, Rob Fitzpatrick attended and gave presentations at a Dryland Salinity forum in Cummins, Eyre Peninsula. The forum was organised by the South Australian Dryland Salinity Committee.

In September 1999, Rob Fitzpatrick attended a "Workshop on Remediation & Assessment of Broadacre Acid Sulfate Soils" at Southern Cross University, Lismore (Queensland). Greg Bowman, Warren Hicks and Rob Fitzpatrick presented a paper on ASS at the East Trinity Inlet, Cairns.

In August, Brian Hughes (PIRSA) and Richard Merry (CSIRO Land & Water), with others, were involved in presenting soil acidity reviews to agribusiness and farmers on Eyre Peninsula and the South-East of South Australia.

Travellers

Jock Churchman and Will Gates attended the 8th Conference of the European Clay groups in Cracow, Poland. About 600 attended. Following the conference they took part in a workshop on clays in the environment in Slovakia.

In October 1999, Dr Mike McLaughlin will attend a workshop to be held at the Forestry Research Institute in Rotorua, New Zealand on the use of ion exchange resins in commercial soil testing laboratories. Dr McLaughlin will also present a paper to the International Council of Metals in the Environment Workshop "Environmental Risk Assessment

Methodologies for Metals and Inorganic Compounds” in Montpellier, France on 17th-21st October 1999.

From July 1st to 5th, 1999 Rob Fitzpatrick attended the 6th International Meeting on Soils with Mediterranean Type of Climate (IMSMTc) in Barcelona, Spain where he delivered a paper entitled: “Nature and significance of minerals formed in Australian Mediterranean soils during land use changes”. He was also co-convenor of symposia on Paleopedology and Clay mineralogy (Commission 7 of the International Union of Soil Science).

In early October, Rob Fitzpatrick and Phil Davies of CSIRO Land and Water leave for a few weeks in northern China (Yangling and Shijiazhuang) to work with colleagues in the Chinese Academy of Science on ACIAR project work.

Arrivals

Dr Isabelle Bertrand and Dr Rebecca Hamon commenced employment with Dr Mike McLaughlin CSIRO Land and Water in Adelaide in August 1999. Dr Bertrand, a graduate from the University of

Montpellier will be studying the chemistry of phosphorus in highly alkaline soils, a project funded by GRDC. Dr Hamon, from the University of Western Australia, will also be working on a GRDC-funded project examining the use of isotopes to measure the long-term availability of phosphorus, cadmium and zinc in soils.

Visitors

Recently, Prof. Paul Bell from Louisiana State University departed CSIRO Land and Water after spending a 5 month sabbatical with Dr Mike McLaughlin. Prof. Bell was studying the degradation and plant uptake of metals complexed by low molecular weight organics.

Dr Chris McLay, from the University of Waikato in New Zealand, is spending a sabbatical in CSIRO Land and Water with Dr Mike McLaughlin from September to December 1999, studying the use of ion exchange resins to determine the bioavailability of heavy metals in contaminated soils. Dr McLay can be contacted on (08) 8303 8697.

Consolidation of CSIRO Soil Reports

When it comes to soil in the Riverina irrigation areas, variety is the name of the game. There are more than 90 different soil types in the Murrumbidgee and Coleambally Irrigation Areas and almost as many studies on the soils with 80 published by various researchers in the past three decades.

That’s part of the reason for the latest technical report produced by CSIRO Land and Water Griffith which combines 30 years soil data into one report.

Physical properties of soils in the Murrumbidgee and Coleambally Irrigation Areas is the culmination of work carried out by University of New England student John Hornbuckle and supervised by Dr Evan Christen.

Information is given on the five broad soil groups: clays, red brown earths, transitional red brown earths, sands over clays and deep sandy soils.

Dr Christen believes the report, which was launched last month at an ASSSI meeting at Yanco,

fills a desperate need. “It is hoped that this document is the first step in building a comprehensive reference of soil physical attributes for the MIA and CIA,” he said.

The review has brought together most of the available data on soil physical properties in the two irrigation areas and includes some information which has never been published before or which has only appeared in informal CSIRO publications.

Mr Hornbuckle completed this report as part of a summer studentship program run annually at CSIRO Land and Water, Griffith. His summer studentship was backed by industry, with Parle Foods, Griffith, and the Department of Land and Water Conservation, Leeton, funding the study.

Copies of the report are available for \$30 from CSIRO Land and Water, Griffith, Private Mail Bag 5, GRIFFITH, NSW, 2680, phone (02) 6960 1500 or fax (02) 6960 1600. For more information: contact Dr Evan Christen on (02) 6960 1586 or e-mail Evan.Christen@grf.clw.csiro.au.



ABOVE: Evan Christen reviews the CSIRO's latest technical report.

NEW MEMBERS

The ASSSI would like to welcome the following new members:

Isabelle Bertrand

PhD
CSIRO Land and Water
SA Branch
Areas of Interest:
chemistry of
phosphorus and trace
elements in soils

Belinda Chapman

BSc (Env Studies)
Griffith University
Qld Branch
Areas of interest:
nutrient removal by
wetlands

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Natural Resources
Qld Branch
Areas of interest: soil
survey, land
evaluation, pedology

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NSW Branch
Areas of interest:
contaminant soil
science

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Areas of interest:
contaminated site
remediation

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Areas of interest: acid
sulfate soils

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Areas of interest: acid
sulfate soils

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agricultural soil
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contaminant
transport modelling

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Department of
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Qld Branch
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landscape health
monitoring

A. Motaleb Bhuiyan

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CSIRO Land and Water
Areas of interest:
rice growing soils
and salinity

Andrew Williams

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Areas of interest:
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and soil mechanics,
Middle Eastern soil
survey

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Areas of interest: acid
sulfate soil processes

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Natural Resources
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Areas of interest: acid
sulfate soils

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Southern
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Areas of interest:
irrigation effects on
soil structure

Henry Parsons

BE (Civil)
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Earthtech Consultants
(Qld) Pty Ltd
Qld Branch
Areas of interest: lab
technician and civil
consultant

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agricultural soil
science

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Oz Soils 3 ... Learning about soils in a visual and interactive way

Peter Lockwood and Heiko Daniel from the School of Rural Science and Natural Resources at the University of New England talk about the latest version of the Oz Soils interactive educational program.

Introduction

As readers of this newsletter know well, soil is one of Australia's most valuable and fragile resources. It is essential that our future natural resource managers understand the fundamentals of how soils behave, and how soil interacts with other ecosystem components. At university, introductory soil science is taught to an audience with a wide range of backgrounds and interests, and the authors' experience has been that the learning environment of this diverse group of students can be greatly enriched by offering study material in a variety of forms. One new and increasingly valuable educational medium is computer-based interactive multimedia. This medium particularly caters for learners who enjoy learning through the use of pictures and animations in preference to text.

Oz Soils is such an interactive multimedia program, and has been developed at the University of New England by Peter Lockwood, Heiko Daniel and Kerry Greenwood. Its initial purpose is to offer more flexibility and an enhanced learning environment for our introductory soil science classes. However, the Oz Soils program is structured in an adaptable modular form, so that it can be of value to anyone who wishes to study fundamental soil concepts and processes. The program has four major sections (Figure 1): the Nutrient Cycle, the Hydrological Cycle, Soil Structure, and Soils and the Landscape. Each main section is made up of modules which contain animations and activities. In total there are 18 modules in Oz Soils 3.

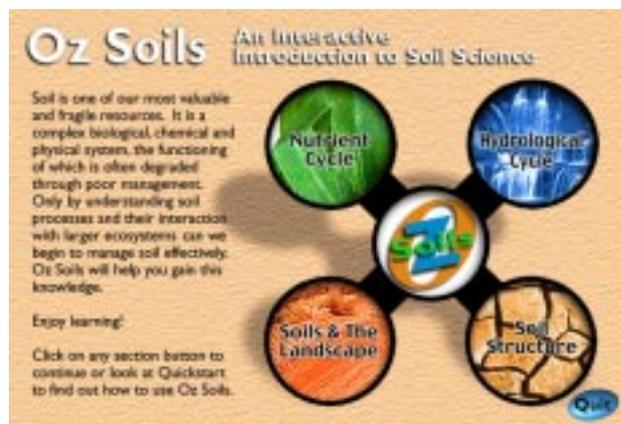


FIGURE 1: Main menu screen showing the four major sections

Educational uses

To illustrate how the program can be used, here is one example of how internal students at the University of New England work with Oz Soils. After having attended lectures on the nature and role of soil structure, students are directed to Oz Soils for further study. A student can navigate, by pointing and clicking on hypertext links, from the Oz Soils opening screen to the Hierarchy of Soil Structure module.

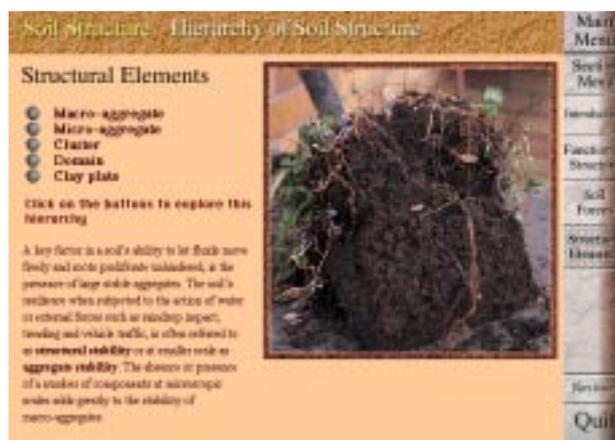


FIGURE 2: Hierarchy of soil structure

Once inside the module (Figure 2) the student finds several screens, each of which addresses a different aspect of the topic, and demands some appropriate activity. For example, one screen contains a sequence of buttons which, when clicked, zoom the viewer into a spadeful of soil, illustrating the arrangement of soil particles at each level from macro-structure to clay crystals. The student can explore the screens within a module in any order, but at the end is presented with a series of revision questions. The answers that the student enters elicit a response from the program in the form of praise or an admonition coupled with an informative comment. The student can thus quickly assess whether she or he has in fact understood the material to a satisfactory degree, and, if not, is encouraged to return for further study. Finally, armed with a conceptual understanding of soil structure, students attend a laboratory practical class in which they assess soil structural stability, slaking and dispersion for a range of soil types.

To give another example, students can expand their understanding of soils and the landscape by using the computer to examine a range of soil sites, their particular soil profile characteristics, and their

associated land use. In the Australian Soils module, students explore a number of soil profiles and their associated landscapes from different environments in Australia (Figure 3).



FIGURE 3: Soil profile and landscape from the Australian Soils module

Each soil profile/landscape pair includes a series of questions and answers that leads the students through the important features of that soil, and encourages students to apply knowledge gained from other modules of specific concepts and soil processes. The procedure of stepping through the sequence of questions is analogous to the Socratic dialogue technique a lecturer might use with students at a stop on an excursion, and has the advantage that soils from a wide range of environments can be explored.

Evaluation

Several formative evaluations of Oz Soils have been carried out as an integral part of the development process. In 1995 and again in 1996, students who had been using Oz Soils 2 for a semester as part of their introductory soil science unit (SOIL 211) were asked, by means of a questionnaire, to evaluate the program (Lockwood and Daniel, 1997). The main

theme running through the responses to the questionnaires is that students had a strongly positive response to Oz Soils. They found it easy to use, enjoyable, and felt that it was educationally effective. Some typical responses to questions are shown in Table 1.

In addition, we watched and videotaped students as they sat at the computer using Oz Soils, and during a follow-up interview. These observations enabled improvements to be made in the program interface and navigation. A study was also made of learning strategies used by students in their work with Oz Soils (McLeod et al., 1998).

Conclusion

The positive response we have had to Oz Soils has encouraged us to develop the program further, and has provided us with insights into what works with interactive multimedia and what doesn't. Users have liked the high degree of interactivity and the use of self-test revision questions. Being able to offer Oz Soils to both Windows and Macintosh users has been an advantage, especially when the program is served out to students in computer laboratories.

Ordering information about the Oz Soils version 3.0 CD-ROM can be found in the brochure which is included in this newsletter. More information about the program, and a down-loadable demo is obtainable via the World Wide Web at: <http://www.une.edu.au/agronomy/ozsoils.html>

References

- Lockwood, P.V. and Daniel, H. (1997). Computer-assisted teaching in soil science. *Sciences of Soils* 2, 1997 at <http://www.hintze-online.com/sos/1997/Articles/Art5/>
- McLeod, R.J., Daniel, H. and Lockwood, P.V. (1998). A Study of learning strategies used by students with the Oz Soils interactive multimedia program. *EdTech '98 Proceedings* at <http://cleo.murdoch.edu.au/gen/aset/confs/edtech98/pubs/articles/m/mcleod.html>

TABLE 1: Summary of responses to some of the questions asked of SOIL 211 students in 1995 and 1996 (sample size = 170)

Statement	%Yes	%No
• As preparation for a practical class, Oz Soils was more effective than written pre-work notes.	92	8
• Working with Oz Soils reinforced the material presented in lectures.	95	5
• I think that I would learn more in an hour studying a textbook than in the same period spent working with Oz Soils.	10	90
• The content of Oz Soils was not useful because it was too simple.	9	91
• Working with Oz Soils was more interesting than studying the same material in a text book or written practical notes.	97	3
• The animations in Oz Soils helped to explain the content.	98	2
• The multiple choice revision questions for each section were valuable.	98	2
• I think it would be worthwhile to expand Oz Soils and make it more widely available so that it can become a bigger part of the teaching in Soil Science 211.	94	6

Vale

GERARD (DICK) BLACKBURN 1918 - 1999

Dick Blackburn, who was a Life Member of the S. A. Branch of this Society, died in Adelaide on 6 August, 1999, aged 81, after a long battle with leukaemia. He was well known as a pedologist and contributed much to knowledge of southern Australian soils and landscapes.

Dick graduated from the University of Melbourne with a B. Agr. Sci. degree and began his career as a pedologist at CSIRO Division of Soils in Adelaide in 1946. He was based in the Division's Adelaide laboratories for 37 years, until his retirement in 1983.

Here he became a member of a group of pedologists, recruited by J.A. Prescott and J.K. Taylor, and at that time led by C.G. Stephens, who had established soil survey as a basic tool for the assessment of land capability, especially in relation to irrigation. This group, together with pedologists in the other regional laboratories of the Division were major contributors during the period (1945-1955) recognised by J.K. Taylor as the peak of activity in soil surveys in Australia. Dick was a leading member of that generation, who achieved national and international acclaim for the quality of their contributions to practical and theoretical aspects of soil science.

One of Dick's earliest field studies, starting in 1948, was carried out with Bob Baker of the S.A. Dept of Agriculture. Their aim was to relate erosion in the north of South Australia to soil factors. Soon afterwards, he began his long association with work on the soils of western Victoria and the south-east of South Australia, when he worked with Ian Leslie in the Coleraine area.

Many other surveys in that region followed, and among those he worked with were Wally Litchfield, Ted Jackson and John Loveday. His name is notably associated with the surveys of the Ninety Mile Desert region and its development for agriculture.

He was a gifted teacher and contributed much to the practical training of young pedologists, as well as introducing chemists, physicists and others to soils in the field.

He contributed also to the planning and selection of sites for field studies by other soil scientists - for example, he determined the best location in the south-east of SA for the Soils

Division's classic experiment on the contribution of ground water to water use by vegetation.

His work in the south-east region culminated in the identification and meticulous mapping of extensive stranded beach ridges originally proposed by the geologist Reg Sprigg. In 1956, Dick collaborated again with Bob Baker on the international stage when they carried out an arduous and foot-slogging survey of the soils of the State of Brunei, North-West Borneo.

Dick was always more interested in the practical use of soils and how this was influenced by their origin, rather than in their formal classification. His interest in wind borne dust (parna) and its associated salts was probably triggered by his work with John Hutton and Bob Clarke on the volcanic ash content of soils around Mt Gambier. Later he showed the importance of salt in soil dust contributing to salinity in the River Murray Basin.

Dick had a unique interest in the history of soil investigations in Australia. He kept meticulous records of his own work, from which he could provide accurate information on all the field work he did during his career, and he collected a great library of material relevant to Australian soils and agriculture.

Dick gave a very well documented collection of slides to CSIRO, which is housed in the CSIRO Land & Water library in Adelaide. After his retirement in 1983, he began to gather information for a history of the development of irrigation from early settlement to 1920. The manuscript of this book was completed shortly before his death and we look forward to seeing it in print. During his retirement he also meticulously edited hundreds of profile descriptions for the CSIRO archival soils database.

His scientific work over the years represents a major contribution to Australian soil science and agriculture, but perhaps more than for anything else, Dick will be remembered as a quietly spoken, kindly man, a good husband to his wife Jean and and father to his three children, and as a man of high principles, who was an ardent supporter of social justice.

Ken Lee, Bill Emerson,

Rob Fitzpatrick and Malcolm Wright

AJSR Contents

Contents of the Australian Journal of Soil Research, Volume 37, No 5, 1999.

Volume 37, No 5

The four laws of soil chemistry: the Leeper lecture 1998.

N. J. Barrow

Influence of earthworms, Aporectodea spp. (Lumbricidae), on lime burial in pasture soils in south-eastern Australia.

G. H. Baker, P. J. Carter, V. J. Barrett

Effect of contrasting farm management on vegetation and biochemical, chemical, and biological condition of moist steep-land soils of the South Island high country, New Zealand.

P. D. McIntosh, R. S. Gibson, S. Saggart, G. W. Yeates, P. McGimpsey

Sowing wheat or field pea as rotation crops after irrigated cotton in a grey Vertisol.

N. R. Hulugalle, P. C. Entwistle, J. L. Cooper, F. Scott, D. B. Nehl, S. J. Allen, L. A. Finlay

Effects of cattle treading on physical properties of three soils used for dairy farming in the Waikato, North Island, New Zealand.

P. L. Singleton, B. Addison

Categories of soil structure based on mechanical behaviour and their evaluation using additions of lime and gypsum on a sodic Vertisol.

K. Y. Chan, A. R. Dexter, D. C. McKenzie

Clay mineralogy as affecting disaggregation in some palygorskite containing soils of the Jordan and Bet-She'an Valleys.

Alexander Neaman, Arieh Singer, Karl Stahr

Vegetative filter strips to control sediment movement in forest plantations: validation of a simple model using field data.

R. J. Loch, T. Espigares, A. Costantini, R. Garthe, K. Bubb

Sediment generation from forest roads: bed and eroded sediment size distributions, and runoff management strategies.

A. Costantini, R. J. Loch, R. D. Connolly, R. Garthe

Differences in particle density between field-moist and oven-dry samples from Allophanic Soils.

P. L. Singleton, B. Addison, M. Boyes

Development of soil morphological descriptors to improve field estimation of hydraulic conductivity.

E. Griffiths, T. H. Webb, J. P. C. Watt, P. L. Singleton

Short rotation forestry for land treatment of effluent: a lysimeter study.

J. K. F. Roygard, S. R. Green, B. E. Clothier, R. E. H. Sims, N. S. Bolan

Soil solution chemistry of contrasting soils amended with heavy metals.

H. J. Percival, T. W. Speir, A. Parshotam

Aluminium speciation in seasonally dry high country soils, South Island, New Zealand.

M. L. Adams, P. D. McIntosh, R. D. Patterson, K. J. Powell

 **AJSR is available on the web at**
www.publish.csiro.au/journal/ajsr/index.html

Riverine Plain Bus Tour

19-20 November 1999

Organised by the Victorian and Riverina Branches of the ASSSI

A two day tour of northern Victoria and southern N.S.W. studying depositional systems in the Riverine Plain and their relationship to climate changes, geomorphology and agricultural land use.

Sessions will be led by Dr Bruce Cockroft and Professor Jim Bowler.

Tour costs should not exceed \$170 (members) or \$180 (non-members) and includes bus travel, all meals, overnight accommodation, 4-hr riverboat cruise (with live entertainment) and tour handbook. Persons wishing to join the tour (or some tour sessions) should indicate their interest ASAP.

Contact David Burrow for further information

Institute of Sustainable Irrigated Agriculture (ISIA)

Private Bag 1, Ferguson Road

Tatura Victoria 3616

Ph: (03) 58 335 298 Fax: (03) 58 335 299

Email: david.burrow@nre.vic.gov.au

Leeper Lecture '99

The GW Leeper Memorial Lecture is the premier annual event for the Victorian Branch of ASSSI. This year it will be presented by Peter Attiwill on "Forest soils: cycles, sustainability and sequestration".

All interested parties are invited to the free public lecture:

*5pm Friday 26th November 1999
Turner Lecture Theatre, University of Melbourne*

Attiwill and Leeper (Forest Soils and Nutrient Cycles: Melbourne University Press, 1987) chose as their themes the differences between nutrient cycling in forests and in agriculture, and the peculiar nature of forests and soils in Australia. These themes will be developed further in this lecture, which will address major developments in the study of forest soils.

Cycles of nutrients in forests are biologically driven. We distinguish between biological mineralization (the release of carbon-bonded nitrogen and sulphur as a by-product of the oxidation of carbon), and biochemical mineralization (the enzymic hydrolysis of ester-bonded sulphur and phosphorus external to the cell membrane).

Biological mineralization is driven by the need for energy whereas biochemical mineralization is driven by the search for sulphur and phosphorus. Thus whereas the mineralization of phosphorus is a direct process, nitrogen mineralization is a consequential process and sulphur mineralization falls somewhere in between. While we can measure the rate of N-mineralization directly, the measurement of the rate of P-mineralization is always thwarted by the abundance of surfaces to adsorb P.

The long-term sustainability of N-supply then depends on estimates of N-inputs in the rain and by N₂-fixation; the long-term sustainability of P-supply depends on the rate at which lower-class (in terms of availability) reserves of P (including the P in parent rock) move to first-class reserves.

The theme of 'class' applies also to the quality of soil organic matter. The major pool of carbon in forests is in the soil. The only way in which carbon can be sequestered by forests in the long-term is by storage as low-class reserves in the soil. The search for empirical definition of classes of soil organic matter is a major thrust in world research as we attempt to ameliorate atmospheric emissions of CO₂ by afforestation and improved forest management.

When we wrote our book, we recognized that by far the greater part of our knowledge of forest nutrition was restricted to phosphorus and nitrogen, always of first interest. This is still true, but it is fitting to conclude the GW Leeper Memorial Lecture with some brief comments about the trace element manganese and its role in the nutrition of the eucalypts.

The lecture will be followed by refreshments in the Systems Garden, then by dinner at University House (Dinner is not free). For more information about the lecture or dinner, please contact Robert Edis on 03 9344 7131 or r.edis@landfood.unimelb.edu.au

Parking is available on-campus, cost is \$2, enter from Swanston St.



DAMOS '99

Describing, analysing & managing our soil



A workshop co-hosted by The University of Sydney and the Australian Soil Science Society (NSW Branch)

- 22nd - 26th of November 1999 covering Soil Properties, Description and Survey, Rural Soil Husbandry, Soil in the City and Technology in Soil Science.
- DAMOS '99 is aimed at younger professionals without significant soil-related training who wish to improve their knowledge in soil science, as well as established professionals reviewing their existing skills base.
- The cost of attending the workshop is as follows:
 - Members of ASSSI (NSW Branch) - \$1100 (5 days), \$250 (1 day)
 - Non-members ASSSI (NSW Branch) - \$1200 (5 days), \$300 (1 day)Includes a workshop dinner, lunch and smokos, transport during sessions and proceedings.
- Registration forms may be obtained by emailing:
brendang@sf.nsw.gov.au OR s.cattle@acss.usyd.edu.au

SOIL

Soil Analysis An Interpretation Manual

KI Peverill, LA Sparrow & DJReuter

Soil Analysis: An Interpretation Manual is a practical guide to soil tests. It considers what soil tests are, when they can be used reliably and consistently, and discusses what limits their application. It is the first nationally accepted publication that is appropriate for Australian soils and conditions.

The first three chapters review the general principles and concepts of soil testing, factors affecting soil test interpretation and soil sampling and handling procedures. The next two chapters describe morphological indicators of soil and include colour plates of major Australian agricultural soils. These are followed by a series of chapters which present soil test calibration data for individual elements or a related group of tests such as the range of soil tests used to interpret soil acidity. Each of these chapters also summarises the reactions of the particular element or parameter in the soil and describes the tests commonly used in Australia.

The final chapter presents a structured approach to nutrient management and making fertiliser recommendations using soil test data.

The manual will be of particular interest to soil and environmental scientists, farm advisers, consultants and primary producers who will find the manual an essential reference to understanding and interpreting soil test data. Many of the soil tests evaluated in the book are used throughout the world.

Soil Analysis: An Interpretation Manual was commissioned and developed by the Australian Soil and Plant Analysis Council (ASPAC). It comprises the work of 37 experts, which has been extensively peer reviewed.

1999, 875 pp, illust, hardback, 0 643 06376 5 \$94.95



Australian Soil Fertility Manual Revised Edition

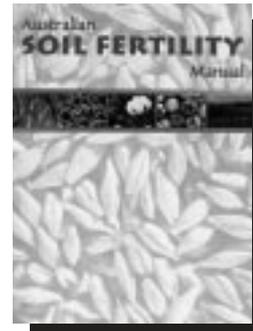
Fertilizer Industry Federation of Australia, Inc.

The *Australian Soil Fertility Manual* has been prepared to help fertilizer dealers, extension workers, consultants, teachers, farmers, horticulturists, graziers and others concerned with the profitable and environmentally safe use of plant nutrients. The first printing sold out almost immediately. This revised edition has updated figures and includes a new chapter on the handling and usage of fertilizers.

The Manual describes the types of agricultural soils, how they are classified and the interaction of soil, water and nutrients. It also provides an insight into how plants utilize nutrients and the role that individual nutrients play in the process of plant growth.

It can be used as a self-study guide, as a supplementary university textbook, for soil fertility workshops or extended short courses about soils and fertilizers.

Dec 1999, 132 pp, illust, paperback, 0 643 06517 2 \$50.00



ORDER FORM

Soil Analysis: An Interpretation Manual @ \$94.95 per copy

Australian Soil Fertility Manual @ \$50.00 per copy

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Book reviews

Peter Wylie takes a quick look at the Soil Analysis Interpretation Manual from a farm adviser's point of view.

Soil Analysis: an Interpretation Manual

Edited KI Peverill, LA Sparrow and DJ Reuter.
(1999) CSIRO Publishing.

Reviewer: Peter Wylie, Agricultural Consultant
email: horizon@esprov.com.au

The new Soil Analysis Interpretation Manual produced by CSIRO is an important contribution to the on-going problem of providing fertiliser recommendations from soil tests. More and more farmers are soil testing each year, but a significant number are dissatisfied with the experience.

Some of this dissatisfaction results from a lack of correlation between soil testing, fertiliser use and profit. Errors occur from soil sampling through to interpretation and because fertiliser may not be the most important limitation to crop yield. Climate variability, risks such as frost and waterlogging can override nutrient limitations.

To improve soil testing, the limitations on yield and interactions between nutrients and other factors, such as plant disease need to be taken into account when making recommendations. Advisers need to consider the whole crop and climate situation, and not just to read soil fertiliser recommendations from a chart.

The Interpretation manual includes a good discussion of the many factors which affect soil fertility and plant growth which will help advisers improve their skills at predicting fertiliser needs or at least knowing when the soil test procedure is at best only a rough approximation.

The manual goes on to provide a good discussion on the properties of soils which affect plant growth, with excellent detail on such aspects as organic carbon and salinity. This of course is very relevant to nutrition where recommendations cannot be given wisely unless the properties and limitations of the soil in question are considered.

Chapters on soil morphology and physical indicators for assessing soil fertility add to the discussion of why plants may not be growing well or yielding to full potential. These physical descriptors and their influence on plant growth will become more

important in years to come as interest grows in the interpretation of yield maps now becoming available from precision farming technology.

The early days of precision farming are suggesting that physical properties or restrictions on plant growth are as important as chemical fertility in limiting plant growth and certainly a vital part of interpreting yield variations in paddocks.

Soil salinity is often a hidden limitation to plant growth. The widespread occurrence of salt in the subsoil of such large cropping areas as the brigalow belt of northern NSW and Queensland requires much greater awareness by farmers and advisers.

Where sub-surface salinity is suspected, more detailed study by way of soil testing is warranted. The chapter on soil salinity and the critical values for many crops provide a good basis for advisers to help farmers learn more about their land and how much salinity might be restricting yields. Although there is little we can do about rectifying subsoil salinity, if we know it is there it will help in the diagnosis of poor yields in dry years and improve recommendations of fertiliser in accordance with yield potential.

For nitrogen, the manual provides considerable discussion about the problems and pitfalls of nitrogen testing, and quite rightly points out that soil N tests are unlikely to provide definitive information about the quantity of N needed for a particular crop. The main question for advisers is whether to use soil tests for N at all, and if they are used, how much confidence to place in them and how much they should be modified by other knowledge about the soil and cropping system. This is not answered, but perhaps is the subject for a considerable volume of its own.

Soil tests have been more effective for predicting the need for phosphate fertiliser, but once again there is room for improvements in prediction using other information, such as the P buffer capacities of the soil and knowledge of the site and its history. The interactions between various crop sequences, fallow length and crop associations. Mycorrhizae, is one factor which has now been well documented in northern Australia, but received only passing mention in the manual.

The manual provides good discussion on reasons for poor correlations between yield response to applied P and soil P tests, but leaves the full story of making recommendations up in the air. The conclusion, that a calibrated soil test needs to be interpreted in the light of the soil/crop/environment in which the calibration was obtained sounds fine, but there will always be situations where we do not have research data for calibrations and more general rules of interpretation are needed. The final chapter on making recommendations based on soil tests provides further discussion on P, but there still appears to be a lot of need for experience in this difficult area.

Chapters on trace elements provide a detailed coverage of current knowledge on soil analysis for these nutrients. However, in many cases there is still room for more research and improvement in our understanding of these nutrients. Zinc is one element I am familiar with that still requires more research before we have a reliable soil testing procedure.

Overall I believe the manual is more than an excellent reference on the subject of soil testing, it is a refresher course in soil science. For those of us who

studied soil science some time ago, the chapter on soil classification is a concise reference to the latest systems, and the discussions on soil factors which affect plant growth provide a good update of our soils knowledge.

Whilst the book is an excellent reference, there is perhaps still a need for workshops or refresher courses to help advisers absorb the large amount of information that is now available to help make better interpretations of soil analyses for farmers.

Peter Wylie



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SHORT COURSE SOIL TECHNOLOGY - CONTAMINATED LAND

at **THE UNIVERSITY OF WESTERN AUSTRALIA, PERTH, WA**
Monday 22 November to Friday 26 November 1999

(Presented in conjunction with Environmental & Earth Sciences Pty Ltd)

The 5 day course will consist of the following sessions:

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- 2 **Chemical Properties of Soils**
(Includes lab. sessions)
- 3 & 4 **Classification of Wastes, Design and Monitoring of Landfills**
(Includes site visit to Redhill Transfer station-counts as one full day)
- 5 **Applied Ground Chemistry and Physics**
- 6 **Characterisation and Management of Pyritic Materials and other Mine Wastes**
- 7 & 8 **Contaminated Site Assessment**
(Includes site visit)
- 9 & 10 **Contaminated Site Remediation**
(Includes visit to a commercial laboratory)

Cost (exclusive of accommodation and dinner):

Five days	\$1,500	lectures, laboratory sessions, 3 field visits, workshop course notes
One day	\$400	lectures, laboratory sessions, field visit, workshop course notes
Half day	\$250	lectures (laboratory session if applicable)

Closing date for applications:

15th November 1999

For further information contact:

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University of WA
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email: sandra.maynard@uwa.edu.au
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Fax: 08- 9380 1050

China Calling

Helen Suter and Robert van de Graaff of ASSSI's Victorian Branch report on a recent trip to the Soil and Environmental Sciences Meeting in Nanching, China

We were fortunate enough to recently present papers at the 12th International Conference on Chemistry for Protection of the Environment in Nanjing, China. The three-day conference was held at the Institute of Soil Science, Chinese Academy of Sciences and was co-organised by the Technical University of Lublin, Poland. It was well attended by scientists from Asia, Europe, North America as well as by ourselves and two fellow Australians (Dr Ravi Naidu, SA, and Dr Xu Zhihong, Qld) and two New Zealanders.

The conference covered a broad range of environmental topics ranging from the treatment and disposal of wastes, to methane contributions to the atmosphere from wet paddy soils under rice growing and chemical contamination of the environment, especially with heavy metals. There were 40 oral presentations and 16 poster papers.

A special honour was extended to Dr Ravi Naidu, who heads the Remediation, Rehabilitation and Ecosystem Reconstruction Project within CSIRO Land and Water in Adelaide, to present the final remarks when the conference was concluded.

Professor W.E.H. Blum from Vienna gave a thought provoking keynote speech on land use as a chemical threat to the environment. He presented statistics about the total areas of land taken up by "exclusive" land uses each year in the world, such as being covered by buildings and roads.

Professor Reiner Horn from Kiel in Germany showed that soil structure played a major role in adsorption and desorption processes. It could take an enormous length of time for a nutrient, for example, to move from the interior of a ped to the outside and become available to the plant.

Another thing that stood out at the conference

was that many people around the world, not least in China and Japan, were actively working on how to effectively treat and dispose of sewage and industrial wastewater on land or to open water.

A lighter afternoon was enjoyed by those who joined the excursion to the Purple Mountains, where the mausoleum of Dr Sun Yat-Sen, the revered founder and first President of a liberated China, as well as an important Buddhist Temple and the tomb of the first Ming dynasty emperor are located. The finest of Chinese cuisine was tasted by the participants, including a special "Welcome" banquet at the Jinling Hotel in downtown Nanjing. All attendees seemed to enjoy the conference thoroughly.

We continued our travels to inspect mine tailings rehabilitation projects near Tong Ling and Yuanqu in the company of Professor Dr Cao Zhihong and Dr Naidu. We then visited China's most famous mountain, Mt Huangshan (Yellow Mountain), as guests of the Tong Ling Copper Company. Huangshan consists of a granite pluton dissected by precipitously steep valleys hundreds of meters deep, with craggy ridges, and balancing huge granite blocks at the many peaks. A forest of pines, bamboo and deciduous trees cover the slopes that have soil, and 'bonsai' pines grow from cracks in vertical rock walls. It looks just like many Chinese paintings of mountain landscapes. The Chinese say there are five famous mountains in their country that one wants to see in one's life time, but if one has seen Huangshan (which was 'discovered' more recently) one wouldn't want to see the others any more. We can well believe it.

If any reader wants to have a look at the conference Proceedings, he or she can contact either one of us: vdgraaff@mira.net or hsuter@mira.net.

IUSS Representation

In the latest International Union of Soil Science (IUSS) Bulletin, (p7), there is an announcement that Dr EG (Gordon) Hallsworth, from the South Australian Branch is one of three members who have been elected by the 19 Honorary Members of IUSS to represent them at and take part in the future IUSS Council Meetings, for the period 1998-2000. Meetings will be held in Vienna (7-10 October 1999) and Bangkok (17-22 April 2000), at which the structure of IUSS will be discussed and decided upon. Hence Australia has a representative on the body which will put in place the management of IUSS over the next few years.

The Bangkok meeting will be an Extraordinary Council Meeting to which the Executive Committee and accredited representatives from all National soil science societies and the three Honorary Members will be invited.



CAN ANYONE HELP LOCATE THESE MEMBERS??

The following list of members are those who have not paid at least two years worth of subscriptions to the society and/or have had all their correspondence returned back to me. The list shows their last known address given to the society. They have been placed on an inactive list and will not receive any further correspondence until I receive up to date contact details for them OR they pay their subscription. If anyone has contact details for these members can you let me know either by email: abass@camtech.net.au, phone 08 8351 5084 or fax 08 8351 5184.

Thankyou in anticipation of your help.
Alice Bass

Ms	Grace	Batson	Dairy Research Institute	ELLINBANK VIC
Mr	Mark	Finlay	PMB 260	HORSHAM VIC
Dr	Veronique	Gomendy	University of Melbourne	PARKVILLE VIC
Mr	Masud	Kader	Monash University	CLAYTON VIC
Ms	Louise	Kelly	University of Melbourne	PARKVILLE VIC
Mr	R	Kularatne	13 Nolan Drive	EPPING VIC
Mr	Sam	Nelson	68 Stafford St	ABBOTSFORD VIC
Mr	Augustine	Okom	University of Melbourne	PARKVILLE VIC
Mr	Dean	Platt	PO Box 153 Market St	MELBOURNE VIC
Dr	Shabbir	Shahid	13/25 Eldridge St	FOOTSCRAY VIC
Dr	Bronwyn	Wiseman	68 Stafford Street	ABBOTSFORD VIC
Ms	Beverley	Barnesby	Agriculture WA	SOUTH PERTH WA
Dr	Neil	Coles	2/68 Excelsior Street	SHENTON PARK WA
Mr	Djajadi		University of Western Australia	
Mr	Jizheng	He	Unknown address	

Mrs	Fiona	Jayasundara	University of Western Australia	
Ms	Natalie	Moore	Agriculture WA	PERTH WA
Ms	Evonne	Richmond	University of Western Australia	
Mr	John	Simons	Agriculture WA	ESPERANCE WA
Mr	Jan	Van Moort	Unknown	
Mr	D	Demarco	GPO Box 1600	CANBERRA ACT
Mr	Ross	Ditchfield	18 Mabmridge St	WEETANGERA ACT
Mr	Paul	Gessler	CSIRO Land and Water	CANBERRA ACT
Mr	Derek	Kulasingham	25 Cameron St	FARRER ACT
Ms	Catherine	Nicol	CSIRO Land and Water	CANBERRA ACT
Dr	Emmett	O'Loughlin	Unknown address	
Mr	H	Sardabi	Dept Forestry	CANBERRA ACT
Miss	Leanne	Saunders	129 Antill Street	DOWNER ACT
Mr	Tapash	Biswas	Unit 1, 43 Chandos Street	ASHFIELD NSW
Mrs	Terri	Bulman	Locked Bag 80	LIDCOMBE NSW
Mrs	Rosemary	Doust	10 Brisbane Ave	COWRA NSW
Mr	Said	Mazaheri	9 Davy St	EASTLAKES NSW
Mr	Jeremy	Slattery	Locked Bag No. 4	RICHMOND NSW
Mr	Luke	Vallely	2 Hopetown Street	CAMPERDOWN NSW
Mr	Lalu	Bakti	University of Queensland	ST. LUCIA QLD
Mr	Daniel	Brough	37 Gardiner Street	ALDERLEY QLD
Ms	Karen	Burke	9 Station Rd	SUNNYBANK QLD
Mrs	Kym	Campbell	19 Stewart Street	WITHCOTT QLD
Mrs	Nonilona	Daquiada	3/242 Carmody Road	ST LUCIA QLD
Mr	John	Hagedoorn	33 Thomas Street	TOOWOOMBA MC QLD
Mr	Gregory	Haydon	3 Arlene St	SUNNYBANK QLD
Mr	Tahir	Khan	University of Queensland	ST LUCIA QLD
Ms	Erin	Kilah	4/115 Drayton St	NANANGO QLD
Mr	Peter	Larsen	Sylvatech Pty Ltd	SOUTH BRISBANE QLD
Mr	Brad	McDonald	PO Box 1528	MILTON QLD
Mr	Wayne	Moffitt	445 Upper Edward Street	BRISBANE QLD
Dr	Ross	Nable	CSIRO Land and Water	AITKENVALE QLD
Mr	Egberto	Soto	8 Burke Street	AYR QLD
Mr	Gregory	Spilsbury	5/33 Queens Road	CLAYFIELD QLD
Dr	Jillanne	Turpin	16 Mary Street	TOOWOOMBA QLD
Ms	Monika	Weinand-Craske	239 Stanley Tce	TARINGA QLD
Mr	Muchamad	Yusron	Griffith University	NATHAN QLD
Mr	Mark	Zervoudakis		
Ms	Nathalie	Brown	NSW Agriculture	WAGGA WAGGA NSW
Mrs	Elaine	Murray	CSIRO Land and Water	GRIFFITH NSW
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Mr		Suwardji	Charles Sturt University	WAGGA WAGGA NSW
Dr	Mostafa	Chorom	Shaid Chamran University	AHWAZ IRAN
Mr	Andrew	Dowley	University of Adelaide	GLEN OSMOND SA
Mr	Alan	Richards	Primary Industries SA	ADELAIDE SA
Mr	Euan	Smith	University of Adelaide	GLEN OSMOND SA

The Soil Scientists' Scrapbook

This issue we're not featuring an old picture, but a picture of three 'old salts' of soil science captured together, Keith Norrish (L), Geoff Stirk and John Loveday (R).

Richard Merry (CSIRO Land and Water, Adelaide) captured this photo of three retired soil scientists having one of those impromptu corridor meetings in late 1998. From left to right they are, Keith Norrish, Geoff Stirk and John Loveday. Keith is well known for his work on X-ray analysis of soil and minerals and, although retired, still comes to work most days (including weekends). He



and Geoff, who was prominent in the field of soil physics, live in Adelaide, while John makes his home near Canberra. John is known for his soil survey work in Tasmania and on saline soils. Some of the younger soil scientists will now be able to put faces to the names on papers they regularly reference.

ATTENTION STUDENTS AND EDUCATORS!

The Federal Council has established a Student Development Sub-committee to investigate opportunities to encourage student involvement and professional development within ASSSI. Lyn Abbott was appointed chair of this new sub-committee and she is asking branch presidents to nominate one or more people to become members of the sub-committee. It is anticipated that the Student Development Sub-committee will meet via email to collate information on existing student-related activities, to disseminate this information to all members, to review opportunities for student participation in ASSSI, to identify ways that ASSSI can support students in their development as valued members of the profession. Student participation as members of the sub-committee will also be welcome.

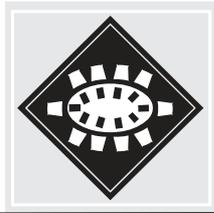
Lyn is keen to have input from all educational institutions involved in soil science related teaching, as well as from others with ideas on this topic. If you are interested in participating, please contact Lyn (labbott@cyllene.uwa.edu.au), or your Branch President.

PHD STUDENTSHIP

A PhD candidate is sought to join a research group working on the long-term environmental impact of the use of moderately saline water for vineyard irrigation in regions such as the Barossa Valley. The student will be based at the Waite Campus, CSIRO Land & Water, Adelaide with a major field site on the SARDI Nuriootpa Research Centre; experimental sites in other grapegrowing regions in South Australia may also be used. The PhD student will also investigate the effects of rainfall on the physical and chemical properties of soil irrigated with moderately saline water.

Dr. Michael McCarthy, SARDI, Dr. Robert Murray, University of Adelaide and Dr. Robert Fitzpatrick, CSIRO Land and Water will supervise the student. The successful candidate will have, or expect to receive, a first class honours in soil science, plant physiology, or a related area. The position is available after July 1999. A total allowance of \$21,000 per annum will be paid. There is an additional 6 months placement in industry.

Further details are available from Dr. M. McCarthy (SARDI), phone 08 8568 6409, fax 08 8568 6449 or e-mail mccarthy.michael@saugov.sa.gov.au.



Federal Council minutes

1. Welcome

The 191st ASSSI Federal Council Meeting was held on the 26th August at the University of Southern Queensland. The President, opened the meeting at 10.26 am by welcoming the members.

2. Attendance

Present: G Price, S Raine, J White, D Lester, L Sullivan (NSW), R Loch (WA proxy), J Standley (Riv proxy), D Edwards (SA proxy), L Abbott (on telephone for items 10.4-10.7), A Bass (executive officer on telephone for item 6)

Apologies: N Menzies, C Ahern, M Littleboy

3. Minutes of the 190th meeting

S Raine moved that the minutes of the previous meeting be accepted as a true and correct record, seconded J Standley. Motion carried.

4. Business arising from minutes

- 4.1 Re: 4.3 L Sullivan indicated that he was still finalising the details of the World Reference Bank visit to Australia and that he would be preparing a submission for financial support to be considered at the next Federal Council meeting.
- 4.2 Re:4.4. **A Bass still to investigate the costs associated with producing an A5 size certificate for distribution to members in 2000.**
- 4.3 Re:6.1 J White noted that the number of members reported at the previous Council meeting was incorrect due to a problem at that time with the database. The total membership number is currently 969.
- 4.4 Re: 7.2 D Lester investigated the potential to raise the bank imposed floor limit for credit card transactions. However, as these transactions are all conducted by mail the bank is unwilling to increase the floor limit. **D Lester is currently investigating other options to streamline the processing of credit card transactions.**
- 4.5 Re: 7.5 **D Lester still to prepare a report on the financial position of the Society at the**

change over of Council as a benchmark for future reference.

- 4.6 Re: 8.3 The recommendations of the Prescott Medal and the Publication Medal Sub-committees were received and approved by the Executive Committee. The Prescott Medal was awarded to Dr Albert Rovira at the SA Branch annual general meeting during August. The Publication Medal sub-committee recommended that no award be made this year. However, this sub-committee raised several concerns regarding the wording and operation of the by-law governing this award. **G Price and S Raine will review the relevant by-law and prepare a submission for consideration at the next Council meeting.**

- 4.7 Re: 10.3 The SA Branch are currently preparing a submission in relation to the rewording of By-law 29 which is expected to be presented at the next council meeting. **R Fitzpatrick to prepare submission for next Council meeting.**

5. President's Report

- 1.1 CPSS Memorandum of Agreement is virtually finalised. The remaining points of concern have been satisfactorily resolved. A response from the Professional Standards Officer to confirm the AIAST Standards Committee level of authority within the AIAST is expected in the next few days. This should allay our fears of another level of review of the standards. This issue was discussed further in item 10.1.
- 1.2 G Price attended the SA branch AGM and presented the Prescott Medal to Dr Albert Rovira in recognition of his life-long work in soil biology and the influence of farming practices on soil microbial activity. SA branch initiatives foreshadowed by President R Fitzpatrick included the publication of a book on SA soils, setting up a web site for SA branch, publication of a SA branch newsletter twice per year and more encouragement for students to be involved in branch activities.
- 2.2 Enquiries on the value of CPSS have been fielded. A response from AIAST Executive Director has been received and parts of his response should be included in a standard letter to be prepared by Federal Council, so the ASSSI Executive Officer can field such enquiries in future.
- 2.3 Joint National Soils Conference. Correspondence has continued with the Chairman and it is expected that G Price will attend the Organising Committee meeting in November. Plans are progressing well and plenary speakers have been approached. A provisional and very general

program as well as an outline of the budget have been received.

6. Executive Officer's Report

- 6.1 As at 26 August 1999, the Society had 969 members of which only 454 (~47%) are financial. Of the total membership, 70 have also paid for CPSS accreditation and 105 for IUSS membership. So far during 1999, 21 members have resigned and the Society as gained 26 new members.
- 6.2 The relatively low number of financial members was discussed at length. It was resolved that **A Bass would provide a list of unfinancial members to each Branch treasurer and that reminder notices would be sent to each unfinancial member.**
- 6.3 Subscription notices for the year 2000 are expected to be ready for mailing in November.

7. Treasurer's Report

- 7.1 As at the 1st July, subscriptions payments totalling \$15724 had been paid using the new credit card (Mastercard, Bankcard, Visa) facility.
- 7.2 D Yates has indicated that the audit of the Society's accounts for the 1998 calendar year is still in progress but is expected to be completed in the near future.
- 7.3 Discussions with the Australian Tax Office have indicated that the Society is not currently sales tax exempt and is unlikely to obtain sales tax exemption status.
- 7.4 **D Lester to investigate the application of the GST on the Society.**
- 7.5 The membership fees for 2000 were discussed. *S Raine moved that the Federal Council subscriptions remain unchanged. Seconded D Edwards. Motion carried. D Lester to ask the Branches to confirm their fees for 2000 by the 30th September.*
- 7.6 *D Lester moved that from 2000, between 1st January and 30th June in any year, applicants for membership will pay the full Federal Council and relevant Branch subscription. However, between 1st July and 31st December, applicants for membership will pay half the full year's subscription. Seconded D Edwards. Motion carried. D Lester to advise A Bass regarding arrangements for the current and future years. A Bass to change application form to indicate changes.*
- 7.7 D Lester indicated that notification for insurance purposes has been received regarding the combined ACT/Riverina/Vic Branch field

workshop in October.

- 7.8 *D Lester moved that the accounts paid during the previous period be endorsed and the outstanding accounts be approved for payment. Seconded S Raine. Motion carried.*

8. Secretary's Report

S Raine tabled a full listing of correspondence in and out for Council. Substantive matters arising from the correspondence and other secretariat responsibilities:

- 8.1 There have been some difficulties experienced in getting the names of directors changed on the Australian Securities and Investment Commission register of incorporated bodies but that this was expected to be resolved within the near future.
- 8.2 The ACT Department of Justice & Community Safety has indicated that the Society is in breach of its duties by failing to lodge the necessary Annual Returns for the 1997 and 1998 calendar years. **S Raine/D Lester to investigate the status of these returns with a view to lodging them as soon as possible.**
- 8.3 A query in relation to the auditor's report for the 1998 National Soils Conference was received from the Victorian Branch. **D Lester to forward a copy of the full report to the Victorian Branch.**
- 8.4 The Australian Academy of Science is holding a soils conference on the 11th-12th November. The Society has been represented on the organising committee and has been asked to assist in the promotion of this function.
- 8.5 Applications for membership from seventeen people were tabled. *S Raine moved that all the applicants be admitted to the Society, seconded J Standley. Motion carried.*

9. Editor's Report

- 9.1 The last issue of Profile was 28 pages in length and has generally been well received. There were some minor problems with the printing process. **J White to consult the printers regarding these concerns.**
- 9.2 The printing numbers for the next issue of Profile will be increased to 1100 based on the revised membership numbers.

10. General Business

- 10.1 G Price indicated that the issues raised at the previous Federal Council meeting in relation to the CPSS memorandum of agreement have not been fully resolved and that the agreement is yet to be signed by the President and Secretary. General discussion of the concerns ensued and it

was resolved that the Executive Committee would continue negotiations with a view to finalising the agreement in the near future. It was also noted that the AIAST prepared signatory page of the agreement had incorrectly named the organisations. Pending satisfactory resolution of the other issues, it was suggested that the ASSSI Secretary correct this page prior to sending it back to AIAST. Concerns were also raised regarding the potential for member feedback into the operation and direction of the Society's accreditation scheme. *S Raine moved that the Federal Council establish an Accreditation Sub-committee to monitor and review the operation of the CPSS accreditation scheme and seek input on the operation of the scheme from the Society's members. Seconded D Edwards. Motion carried. R Loch was elected chair of the Accreditation Sub-committee and directed to co-opt other members as appropriate.*

10.2 G Price noted that I Sargent had resigned as the ASSSI representative on the Soil Science Assessment Panel. A discussion of potential replacements ensued. *L Sullivan moved that the Executive Committee be empowered to identify the appropriate replacement. Seconded J Standley. Motion carried.*

10.3 Potential nominees to the ASSSI representative positions on the CPSS Standards Committee were discussed. *S Raine moved that the Executive Committee be empowered to finalise these representatives. Seconded R Loch. Motion carried.*

10.4 L Sullivan reported that the long-term future of AJSR is uncertain due to falling subscription numbers and asked the Council to consider options for supporting and/or promoting the publication. A discussion of the issues confirmed that the society should endeavour to support the journal when feasible but indicated there was some concern regarding the lack of discounts available to ASSSI members. **L Sullivan indicated that he would convey these concerns to the AJSR Board and discuss the possibility of ASSSI member discounts for both hard copy and electronic versions of the journal.** *L Sullivan moved that the next yearly subscription notice to members include an option for subscription to AJSR. Seconded R Loch. Motion carried. A Bass to arrange appropriate changes to the subscription notices.*

10.5 L Abbott spoke to a prepared document suggesting that the Federal Council identify strategies to encourage student participation within the Society. There was general agreement

on the importance of student involvement in the Society and the role of the Federal Council in a fostering this involvement. *S Raine moved that the Federal Council establish a Student Development Sub-committee to investigate opportunities to encourage student involvement and professional development within the Society. Seconded J White. Motion carried. L Abbott was appointed chair of the Student Development Sub-committee and directed to co-opt members as appropriate.*

10.6 The potential for conflict between the 2002 International Soils Conference (Thailand) and the 2002 National Soils Conference (Perth) was noted. It was suggested that it may be appropriate to schedule the National Conference either immediately before or immediately after the International Conference to encourage the participation of international scientists in the National Conference. L Abbott to investigate options.

10.7 The opportunity of hosting the 2010 international soils conference was raised. **S Raine to write to the IUSS Secretariat to seek details regarding nominating for this event.**

10.8 G Price presented the draft timetable for the 2000 National Conference and indicated that he expects to attend the next organising committee meeting in November. **G Price to discuss details of the NZSSS and ASSSI Conference awards with the organising committee.**

10.9 The presence of the Society on the World Wide Web was discussed. As a general principle, it was resolved that Branches should be responsible for their own site development and site maintenance with hyperlinks to the Federal Council maintained site as appropriate.

10.10 A discussion on the role of Federal Council in marketing and publicising both the Society and soil science in general resolved that the principle focus of the Federal Council should be to provide a valued service to existing members and to position the Society to be attractive to new members. *S Raine proposed that the Federal Council re-establish the Marketing Sub-committee to investigate opportunities for the promotion of the society. Seconded J Standley. Motion carried. J White was appointed chair of the Marketing Sub-committee and directed to co-opt members as appropriate.*

11. Closure

The president declared the meeting closed at 4.02pm. The next meeting of the Federal Council will be held at USQ on the 25th November 1999.



Conferences

11-12 Nov 1999

Fixing the foundations - a national symposium on the role of soil science in sustainable land and water management
fax (02) 6257 4620
ac@science.org.au

22-26 Nov 1999

DAMOS '99 - Describing, analysing and managing our soil, University of Sydney
brendang@sf.nsw.gov.au

22-26 Nov 1999

Short Course in Soil Technology - Contaminated Land, University of WA
tel (08) 9380 3827
fax (08) 9380 1050

Nov 1999

Certificate of Attainment in Soil and Water Management for Urban Development, UWS Hawkesbury
A 5-day course with University accreditation
tel (02) 4570 1690
fax (02) 4570 1520

29 Nov-1 Dec 1999

Frontiers of Catchment Biogeochemistry, Acton
www.cdw.csiro.au/conferences/

1-3 Dec 1999

Environment Institute of Australia - Seeking the balance, Hobart
conventions@mures.com.au

14-18 Feb 2000

International conference on managing natural resources and sustainable agricultural production in the 21st century, New Delhi, India
ISSS Dr A.K. Singh, Indian Agricultural Research Institute, New Delhi 110 012, India,
tel 91 11 573 1494,
fax 91 11 5755

28 Feb-1 Mar 2000

Sodicity Conference: Sodicity Issues in Agricultural Industries, Tatura Victoria
tel (03) 5833 5223
fax (03) 5833 5299
aravind.surapaneni@nre.vic.gov.au
resourceweb/nre-web/conf/sodicity/index

2-5 March 2000

International Landcare Conference, Melbourne
(03) 96906744

11-17th March

World Water Congress, Melbourne
tel (03) 96820244
fax (03) 96820288

9-13 April 2000

5th Australian Waste Convention: New Millenium, New Opportunities, Sydney
tel (02) 9410 1302
fax (02) 9415 1599
quitz@dot.net.au

26 April 2000

4th WA Symposium on Ions in the Soil-Plant-Water Continuum, Perth
tel (08) 9222 3031
fax (08) 9325 7767
dallen@ccwa.wa.gov.au

2-7 July 2000

Tillage at the Threshold of the 21st Century: Looking Ahead, 15th International Conference of the International Soil Tillage Research Organisation, Texas
www.agen.tamu.edu/organizations/istro

11-12 July 2000

Soils 2000 - ASSSI WA Branch triennial conference, Avon Valley, WA
tel (08) 9333 6299
fax (08) 9387 8991
m.wong@ccmar.csiro.au

12-18 July 2000

First International Conference on Soils of Urban, Industrial, Traffic and Mining Areas, IUSS, Essen, Germany
www.ni-essen.de/bodenkunde

21-25 Aug 2000

International Symposium of Advances in Carbon and Nutrient Cycling and Catchment Processes in Managed Forests, Brisbane
tel (07) 38757494
fax (07) 38757459
p.saffigna@mailbox.gu.edu.au

4-6 Sep 2000

Eurosoil 2000, University of Reading, UK
Dr JH Gauld
tel 01221 318611
fax 01224 208065
www.bsss.bangor.ac.uk

17-23 Sep 2000

The First International Symposium on Phosphorus in the Soil-Plant Continuum, Beijing, China
www.general.uwa.edu.au/soilweb/welcome

3-8 Dec 2000

NZSSS/ASSSI National Soils Conference 2000. New Horizons for a New Century, Lincoln University, New Zealand
Shrewbh@lincoln.ac.nz
tel 64 3325 2811
fax 64 3325 384
www.lincoln.ac.nz/cted/NZSSS



**Any conferences, courses, seminars or workshops coming up?
Send *Profile* the details and we'll feature them here.**

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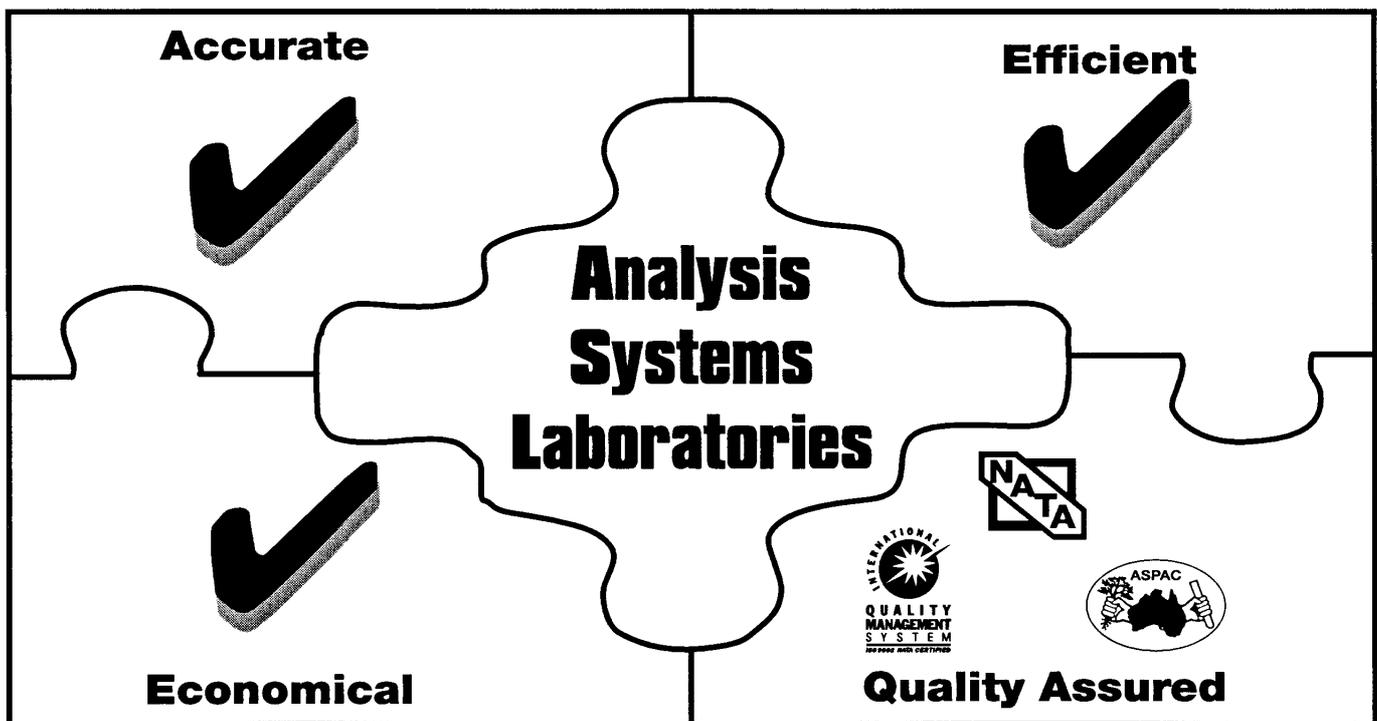
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