

## **2002 Prescott Medal Winner: Professor John W Holmes:**

Professor Holmes made a significant impact on soil science during the latter half of the 20th century in Australia, particularly in the area of soil physics. He tackled difficult and highly relevant problems plaguing Australia, notably salinity, ground water contamination, and the highly inefficient use of irrigation water in agriculture. His work on water budgets under different vegetation types, for example, continues to be relevant to our understanding of how soils function in the environment. He did some of the critical early work on neutron moisture meters, which formed the basis for the current widespread use of these instruments today. This technology has withstood the test of time even while newer, dielectric methods for measuring water content flood the market.

He wrote over 70 peer-reviewed papers, chapters and books during his career. His textbook, *Soil Physics*, (co-authored with Tim Marshall and Calvin Rose – now in its 3rd edition) continues to be used as a teaching resource for level-3 university courses across Australia and is widely acknowledged to be an excellent reference book in irrigation technology.

He contributed widely to the natural-sciences community through various organizations: for example, he was president of the Royal Society of SA, Vice-President of Commission 6 of ISSS, and Chairman of the SA Branch of the Geological Society of Australia.

Profile

**AUSTRALIAN SOCIETY OF SOIL SCIENCE INC.**

ARBN 080 783 106

ABN 96 080 783 106

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.

**The ASSSI is committed to:**

Advancing soil science.

Providing a link between soil scientists and members of kindred bodies within Australia and other countries.

**Specific ASSSI 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

**ASSSI MEMBERSHIP**

For all Membership and CPSS Application and renewals, subscriptions, queries and address changes contact Linda Bennison, ASSSI executive officer on Tel (03) 5974 1758, Fax (03) 5974 11411, email [asssi@bigpond.net.au](mailto:asssi@bigpond.net.au)

**ASSSI WEBSITE**

<http://www.asssi.asn.au> <http://www.asssi.asn.au>

**PROFILE**

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**2003 Profile Deadlines**

15 March, 15 June, 15 September, 15 December  
email to Lyn Abbott [organic@agric.uwa.edu.au](mailto:organic@agric.uwa.edu.au)

**Advertisements**

Advertisements relevant to some aspects of soil science are welcome. Charges are full page \$220, half page \$110, quarter page \$55 (GST inclusive).

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All contributions are welcome, text preferably by email. Please send to the Newsletter Editor for 2003 Lyn Abbott, School of Earth and Geographical Sciences (Soil Science), The University of Western Australia, Crawley WA 6009 Fax 08 9380 1050 Email - [organic@agric.uwa.edu.au](mailto:organic@agric.uwa.edu.au)



# *From the ASSSI President*

## Cameron Grant

Australia is internationally recognized for its creative approach to soil science – and not without reason. With the possible exception of frost-heaving (something only northern hemispherites understand!), Australia is faced with just about every challenge a soil scientist could imagine in his/her wildest dreams. Our soils are ancient and highly weathered so they have low biological, chemical and physical fertility and they tend to acidify, erode and compact relatively easily. Most of our soils are affected in some way or another by salt (e.g. salinity, sodicity, or alkalinity), so organic matter contents, nutrient- and water-availability are often low. Our land harbors peculiar soil-borne diseases, water repellence, and industrial or agricultural contamination. In response to these problems, Australian soil scientists have responded with imaginative and practical contributions, particularly in the published arena. We all know, however, that while these contributions have attracted wide international acclaim, here in Australia their public profile is buried under sexier issues. In this regard, the Australian Society of Soil Science has a role to play, so in this issue of *Profile* I want to outline how we recognize excellent soil science and to suggest how you might help ‘raise the profile’ of soil science.

The Australian Society of Soil Science currently recognizes excellent contributions to soil science through six awards, each listed below with annotations and winners:

### 1. JA Prescott Medal of Soil Science (By-law 24):

- Medal awarded annually, 31<sup>st</sup> May deadline; senior soil scientist; no membership restriction.
- No nominations yet received for 2003 Prescott Medal – The Committee decided to extend the deadline to September 30<sup>th</sup> to enable cases to be developed. We should also think about candidates for 2004 so the Medal can be presented at the ANZSSSS Soils Conference in Sydney.

#### Prescott Medal Winners

Year	Winner	Year	Winner	Year	Winner
1972	CG Stephens	1983	GD Hubble	1994	RJ French
1973	Not awarded	1984	CG Hallsworth	1995	LAG Aylmore
1974	TJ Marshall	1985	JR Freney	1996	Not awarded
1975	JP Quirk	1986	KE Lee	1997	KH Northcote
1976	RG Downes	1987	M Raupach	1998	RW Fitzpatrick
1977	K Norrish	1988	PH Walker	1999	A Rovira
1978	JK Taylor	1989	OT Denmead	2000	MJ Mulcahy
1979	N Collis-George	1990	KG Tiller	2001	BE Clothier
1980	R Brewer	1991	R Gilkes	2002	JW Holmes
1981	BE Butler	1992	WW Emerson	2003	Nominations open
1982	CH Williams	1993	JN Ladd	2004	Nominations open

### 2. ASSSI Publication Medal (By-law 26):

- Medal awarded annually, March 31<sup>st</sup> deadline; must be < 35 years; no ASSSI-membership restriction.
- I am pleased to announce that the 2003 Publication Medal will be awarded to Dr Angus McElnea, for his paper: McElnea AE, Ahern CR, Menzies NW 2002 Improvements to peroxide oxidation methods for analysing sulfur in acid sulfate soils. *Australian Journal of Soil Research* **40**, 1115-1132.
- Nominations for the 2004 Publication Medal close March 31<sup>st</sup> 2004.
- If you know the details of the citations for which the Publication Awards listed below were made prior to 1996, it would be very useful for future Committees to set standards against; contact me with information.

Year	Winner	Year	Winner
1979	PS Sidhu	1989	NW Menzies
1980	MJ Knight	1991	S Boucher
1981	WH Utomo	1995	HJ Di
1982	DJ Chittleborough	1996	KL Greenwood
1983	CT Chartres	2001	G Sheridan
1984	RJ Loch	2002	B Minasny
1986	RR Anand	2003	AE McElnea
1987	JN Hainsworth	2004	Nominations open

*Continued on Page 3*

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### 3. **John K Taylor, OBE, Gold Medal in Soil Science (By-law 27):**

- Medal awarded biennially, 31<sup>st</sup> March deadline; senior soil scientist; no membership restriction.
- As for Prescott Medal, we should think about candidates for 2004 so the Medal can be presented at the ANZSSS Soils Conference in Sydney.

<b>Year</b>	<b>Winner</b>
1984 (Brisbane)	R.J. Coventry
1988 (Canberra)	N.J. Barrow
1992 (Adelaide)	L.F. Molloy
1996 (Melbourne)	P.M. Chalk / C.J. Smith
1998 (Brisbane)	O.T. Denmead
2002 (Perth)	D.T. Strong
2004 (Sydney)	Nominations open

### 4. **Honorary Membership (By-law 6):**

- Annual fees waived if places vacant (maximum 25 places – see list), cases considered annually at final Federal Council meeting after September; 2 types: short-term membership for eminent visitors to Australia; Life membership for Australian soil scientists retired from active employment; maximum 25 places.
- Currently 4 vacancies; some nominations already received and cases will be considered later this year.

#### **Honorary Life Members**

PEV Charman	I Fergus	J Loveday	CW Rose	C Williams
M Churchward	J Freney	TJ Marshall	JP Quirk	Vacant
B Cockroft	C Hawkins	W McArthur	IJ Sergeant	Vacant
N Collis-George	GD Hubble	D McIntyre	R van der Graaff	Vacant
WW Emerson	LE Lee	KH Northcote	SA Waring	Vacant

### 5. **CG Stephens PhD Award in Soil Science (new in 2003):**

- Cash prize to be awarded annually, June 30<sup>th</sup> deadline; based on nominated thesis of recent PhD graduates; must be ASSSI member.
- Several nominations have been received by the deadline this year and these will be considered shortly.

### 6. **ASSSI Conference Presentation Awards (By-law 28):**

- Cash prizes (for best oral & poster presentations) awarded biennially; intended for, but not restricted to, postgraduate students; must be ASSSI member.

List of winners not available at present – information welcome

While the lists above contain an impressive catalogue of who's who in Australian soil science, we are not doing enough to promote soil science and we need to consider what else can be done. For a start, I suggest our Award-winners are our best ambassadors of soil science and we should promote their work when Awards are made. Most of us are not trained to promote our own work, so perhaps the Awards should be accompanied by an offer of professional media training (lots of day-long courses on how to deal with the media). If representatives of the local media are invited to the Award presentations, this would foster good communication of soil science and its relevance to the Australian community.

Secondly, I suggest it is not unreasonable to ask our previous winners (particularly senior members) to consider helping the Society perpetuate its Awards through bequests, such as that given by the JK Taylor family in 1983. Competition for big philanthropic support is formidable in Australia and we don't do very well in soil science pitted against the RSPCA or the Animal Welfare League. Nevertheless, small educational scholarships (e.g. for national and international travel, books or software) are good examples of how modest bequests can have a big impact on the career-training opportunities for students and recent graduates of soil science, or even postdoctoral fellows. Modest bequests are better than nothing and the more bequests there are the greater will be the opportunities to promote soil science through the Society. Federal Council is currently developing material for potential bequest donors, so watch this space.

If you have ideas on how we can better recognize excellence in Australian soil science, please feel free to contact me or your Federal Council representative. Please consider nominating a candidate for one of the Awards listed above.

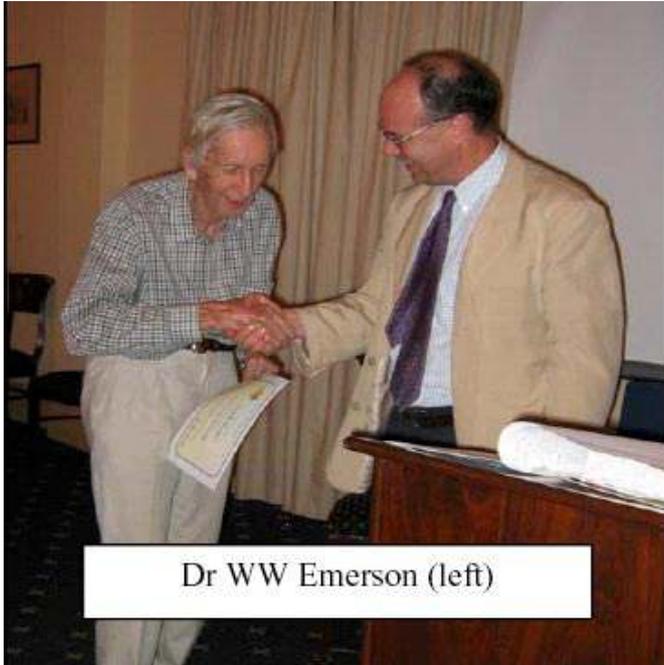
Finally, our Executive Officer, Ms Linda Bennison, has been awarded a Churchill Travel Fellowship and will be overseas for several weeks this winter. She has arranged for a skeleton staff to operate the ASSSI Office in her absence, but if there are urgent matters that cannot await her return, please refer them to me. The Society congratulates Linda and wishes her well in her travels. No doubt she will report on her activities when she returns to Australia.

Cameron Grant, ASSSI Federal President

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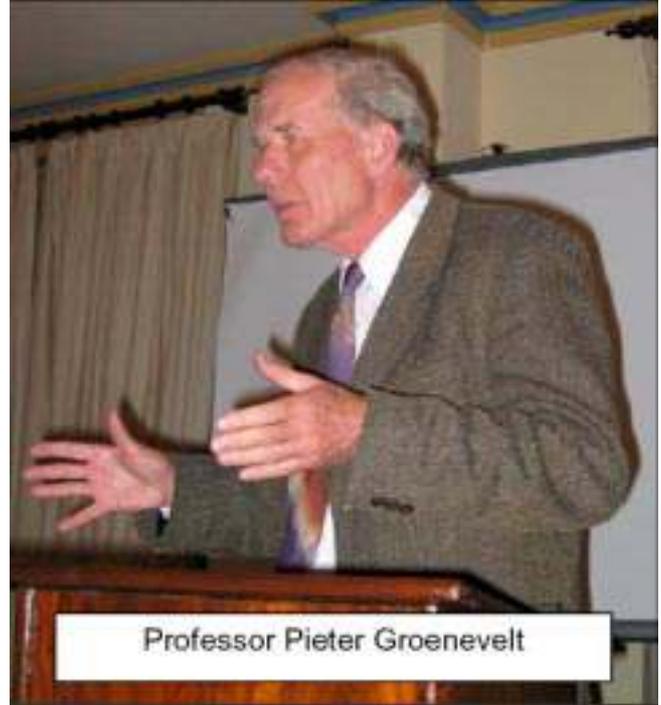
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## ***Congratulations to ASSSI Award Winners***



Dr WW Emerson (left)

## ***Canadian soil scientist visits SA Branch***



Professor Pieter Groenevelt

## **South Australian Branch Special Events**

Forty-six members of the SA Branch attended a special meeting on April 23<sup>rd</sup> at the Edinburgh Hotel, Mitcham, to present the 2002 JA Prescott Medal of Soil Science to Professor John W Holmes (see report on Page 1), and to present Honorary Life Membership to Dr W (Bill) W Emerson (see report Page 26). The after dinner speaker was Professor Pieter H Groenevelt (University of Guelph, Canada) who gave a talk entitled "Tragi-comedies in Soil Physics", in which he outlined some of his recent advances in cracking clays and soil water retention, and told us how both of these are intimately related to making sausages.

## **..& in Queensland also**



Neil McKenzie receiving Certificate of Appreciation from Qld branch President Mike Grundy

## **NZSSS/ASSSI Conference**

**5-10 December 2004**

[www.icms.com.au/supersoil](http://www.icms.com.au/supersoil)

@ The University of Sydney

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# ASSSI Strategic Plan 2002-2006

website:<http://www.asssi.asn.au>

“ASSSI promotes the field of soil science and its important relationship with wise management of the soil resource throughout Australia.”

**What is ASSSI?** 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 currently comprises a Federal Council and seven Branches (Qld, NSW, Riverina, ACT, Vic, SA and WA). Liability of members is limited. Federal Council consists of: Federal Executive: President, Vice President, Secretary, Treasurer Branch Presidents, Newsletter Editor. An Executive Officer is employed by ASSSI to be responsible for dealing with membership issues, promotional material and administration of CPSS.

**Accreditation for soil scientists is available: Certified Professional Soil Scientists (CPSS)**

## What does ASSSI do?

- Promotes soil science to the wider community as essential for natural resource management and production.
- Sets professional standards related to soil science.
- Provides a forum for wide debate of soil science issues.
- Provides opportunities for professional development in soil science.
- Coordinates a national focus on issues related to soil, its use and its management
- Provides leadership opportunities for members, including junior soil scientists
- Provides international links (IUSS) through participation in international meetings and initiatives related to research on soil, policy development and implementation
- Participates in policy development and debate related to soils in all environments in Australia
- Takes a leadership role in discussion on education and training related to soil
- Holds conferences (joint with NZ, national and local)
- Supports the bid for IUSS Conference in 2010
- Initiates seminars, workshops, field days, field trips
- Disseminates information - books, articles, affiliation with the Australian Journal of Soil Research

## Enduring Outputs

Nationally recognised accreditation for practicing soil scientists  
High profile of soil science in the community  
High profile of soil science in environmental decision-making processes  
High quality educational opportunities and support for students  
Benchmarking with related organizations  
Effective communication among members  
Effective communication with stakeholders  
Effective communication within the community  
International links  
Affiliation with other related organizations

## Areas of strategic initiatives related to 6 key ASSSI objectives

### *1. To support initiatives which enhance the profile of soil science in Australia*

- Accreditation of Soil Scientists (CPSS) • Educational materials • Public presentations
- Discussion with key government and industry sectors

### *2. To enhance expertise in soil science*

- Development opportunities for junior soil scientists
- Seminars, workshops, training, field trips

### *3. To recognise excellence in soil science*

- Medals for excellence • Student prizes and travel awards

### *4. To provide a forum for discussion*

- Website, email, newsletter, seminars, conferences, workshops

### *5. To increase government and community awareness of soil science*

- Media updates • Workshops

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# *IUSS Secretary General - Prof. Stephen Nortcliff*

## *- his first few months in this position*

I have now almost completed a year as the new Secretary General of IUSS. It has been a sharp learning curve for me, both in understanding the many linkages which IUSS has within Soil Science and beyond and in getting to grips with the administration. During this transition phase I have been most ably assisted by Winfried Blum my predecessor and to some the 'face of global Soil Science' and in particular by Winfried's personal assistant Herma Exner. When I have a problem or query I often have contacted Herma and without fail she has come back with the answer or guidance on where to find the answer! Perhaps my greatest surprise having taken on this role of Secretary General has been to become aware of the extent of our linkages beyond the traditional spheres of Soil Science. I pleased to report that we seem to be very well known amongst the experts in these different fields, who frequently contact me for comments on or contributions to their activities. Again this network of contacts is testament to the enormous efforts made by Winfried Blum during his 12 years as Secretary General.

As Secretary General of IUSS I am strongly supported by the Deputy Secretary General Alfred Hartemink, and we have established a very good working relationship with our President Don Sparks and Vice-President Gary Petersen. I have also appreciated the fine efforts of Peter Luescher as Treasurer in keeping me informed of the day-to-day financial state of the Union. Peter has served IUSS very well for over 12 years, and has indicated he will step down as Treasurer at the end of the year. We are currently seeking a new Treasurer and have received a number of very good quality applications. The new scientific structure of the Union is now fully operational. The structure has the four Divisions as its broad structural framework, and the Chairs of these Divisions are an important part of our continuing development of a scientifically strong and active Union. Our current Chairs are Ahmet Mermut (Division One), Nicola Senesi (Division Two), Wolfgang Burghardt (Division Three) and Emmanuel Frossard (Division Four). Details of IUSS and Divisional activities are regularly posted on our website at [www.iuss.org](http://www.iuss.org) as are other activities of commissions and working groups. On the non-scientific activities of the Union we have strong support of colleagues in developing the administrative and support framework for IUSS. Robin Harris as chair of the Budget and Finance Committee(CBF) has taken on the exceedingly important task of managing our subscription base; John Kimble as Chair of the Committee on Statutes and Structure (CSS) continues to grapple with the task of developing the Statutes and Bye laws in response to numerous comments; and Winfried Blum continues his involvement with IUSS as Chair of the Committee on Prizes and Awards (CPA) taking on the task of a new venture for the Union in developing IUSS awards.

As a result of the support of these officers of the Union, there are many exciting activities ongoing and being planned in IUSS to further promote soil science and to enhance the visibility of soil science to other professionals, policymakers, and the general public. This activity is important not just for IUSS, but also for the subject of Soil Science and the community of Soil Scientists. In recent years we have seen cutbacks in the funding of Soil Science, and there has been concern for the future of the subject. Recently my contacts, particularly in Europe suggest that there is an increasing awareness of the critical roles that soils play in linking components of the global ecosystem and that failure to understand these roles may lead to poor quality environmental decision making and in the extreme, environmental disasters. It is clear however that this key role is not universally recognized! One of the tasks of IUSS is to continue to educate the decision makers of soil's key role in environmental systems.

As mentioned above the IUSS Website at [www.iuss.org](http://www.iuss.org) is an important part of the Union's communication activities. There is extensive information on IUSS, the officers and divisional and commission officers, World Congresses of Soil Science (WCSS), upcoming meetings, activities of the divisions and commissions, past and current IUSS Bulletins, publications, and job openings. Also included are the IUSS statutes and by-laws (as they are developed towards a final version for approval of the next Council Meeting in Philadelphia), honorary members, and links to national soil science societies. Alfred Hartemink has devoted a great deal of time and effort in developing and maintaining this site, and anyone who has submitted material to Alfred will have noticed the short time from when you submitted the material to it actually being active on the website!

The two new awards established by IUSS will be presented at the WCSS. The Dokuchaev Award will be presented for distinguished contributions in basic soil science research and the Liebig Award will be given for seminal contributions in applied soil science research. Details on the nomination process will be provided in forthcoming Bulletins and on the Website. We are also exploring avenues for establishing a Year of the Soil in 2006 and/or an Annual Day of the Soil to enhance the visibility and importance of soils and soil science to the international community, and I would welcome your comments on both these topics, both in respect of the general ideas as well as suggestions on how we might move forwards towards their establishment.

The IUSS Inter-Congress Meeting is scheduled for April 25-28, 2004 in Philadelphia, PA. Attendees will include the IUSS Executive Committee, divisional and commission officers, subcommission and working group chairs, honorary member representatives, and country representatives to the IUSS Council. Major agenda items will include finalizing the scientific program for the 18<sup>th</sup> WCSS and Council meetings. There will also be an accompanying persons program and a tour of the 18<sup>th</sup> WCSS venue.

As always a major activity of IUSS is the planning for the 18<sup>th</sup> WCSS in Philadelphia, Pennsylvania, USA, July 9-15, 2006. The theme of the Congress is "Frontiers of Soil Science: Technology and the Information Age". Larry Wilding and Lee Sommers are serving as Co-Chairs of the Organizing Committee, and are being ably assisted by a host of other fellow soil scientists who are planning a stimulating scientific program, an array of scientific and cultural tours, and enjoyable social

*Continued on Page 8*

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*From the IUSS Secretary General continued from Page 7*

events. Philadelphia is located only 80 km from the Atlantic Ocean, about 161 km south of New York City, and 192 km north of Washington, D.C. International and domestic travel to and from Philadelphia is available from major airline carriers and train service is also available to and from major cities on the U.S. East Coast. Philadelphia is known as the cradle of democracy, and served as the U.S. capital from 1790-1800. The Declaration of Independence was adopted in Philadelphia, and the U.S. Constitution was written here. Philadelphia is home to Independence Hall, the Liberty Bell, and many other historical attractions. In addition to being one of America's most historic cities, it is rich in the arts and sciences, being home to the world class Philadelphia Museum of Arts, the Rodin Museum, the Pennsylvania Academy of Fine Arts, the Franklin Institute Science Museum, and the Academy of Natural Sciences. We cordially invite all of you to attend and participate in the 18<sup>th</sup> WCSS. For more details on the 18<sup>th</sup> WCSS, please refer to the Website at [www.18wcss.org](http://www.18wcss.org).

Whilst the 2006 Congress is uppermost in most of our minds, I imagine that for many of you, thoughts will already be moving towards thinking of what is to be done for the 2010 World Soil Science Congress in Australia. All I can say is that having looked through the files I am amazed at how early in the planning of a World Congress decisions have to be taken. I welcome the opportunity to be involved in the planning and look forward to the opportunity to talking through the plans for 2010 with many of you.

I wish you well and hope that Soil Science continues to thrive in Australia. If you wish to contribute to the continuing development of IUSS do not hesitate to contact me at [iuss@rdg.ac.uk](mailto:iuss@rdg.ac.uk).

July 2003  
Reading

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## ***Report from ASSSI Executive Officer*** **Linda Bennison**

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Activity in the ASSSI office continues to be dominated by the processing of subs payments and reminder notices. Branch Presidents will have the latest branch lists prior to the meeting showing financial and non-financial members.

The Accreditation Board has reviewed the first batch of OPD diaries and a meeting will be held shortly to review the assessments. The process has been worthwhile, as it has highlighted areas in the handbook that need to be clarified. A second draft of the OPD Diary has been developed to allow members to accurately categorise the time spent on professional development in the five core areas.

Of concern, there have been a couple of cases recently where people have been using ASSSI or CPSS membership certificates when they are not financial members of the society. I suspect that this is an administration problem due to the original certificates not showing a defined time period. The Accreditation Board is going to review the CPSS certificates at their next meeting. Perhaps the ASSSI committee could discuss the matter of the ASSSI membership certificates.

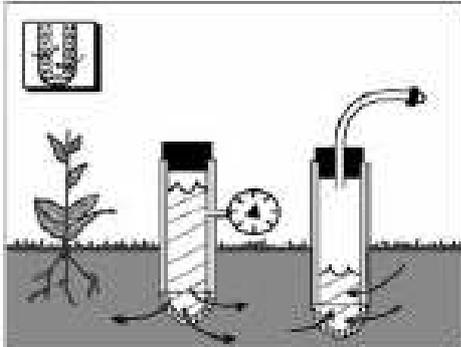
I have not had any spare time to work on ASSSI website development and spoke with Cam about taking this a step further. I would like to ensure that the Grasslands members only area and archive is working smoothly before committing ASSSI to the process. The aim is to have the Grasslands archives in place by June 30 so that members renewing their subscription receive the additional benefit of on-line access to newsletters and proceedings. If we took the same approach with ASSSI and had members only access in place for 2004, that allows six months to collate the archives for the web.

Finally the dates for my Churchill travel are July 5 to August 22. The Fellowship is to study the establishment, structure and maintenance of national and international non-profit organizations. I will be visiting The Netherlands to meet an executive member of the European Grassland Federation and have made an appointment to visit Alfred Hartemink from IUSS the following day. In the UK I will be based at Reading and will ask Stephen Nortcliff at Reading University for a meeting. On an administrative basis, I would like to discuss the IUSS fee collection from overseas members with them and the membership lists for IUSS. I am also interested in gaining an idea of where they want to take IUSS in the future and how this will tie in with the 2010 conference, ASSSI and Australia in general.

During my absence, David and Debbie will be running the office and can assist with ordinary administration matters. They will not be able to handle strategic issues. I will forward the latest membership list to each branch prior to my departure and will keep in touch via email.

Linda Bennison 29/5/03  
ASSSI Executive Officer

# Soil Moisture and Soil Solution Sampling for Waste Water Management

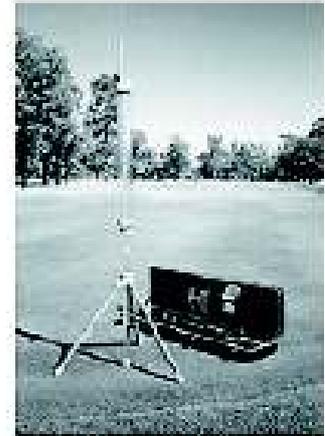


## Suction Lysimeter or Soil Water Sampler

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## Guelph Permeameters

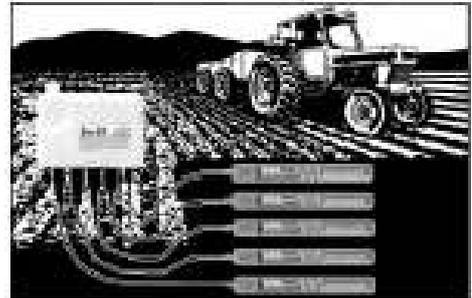
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# *News from the Queensland Branch of ASSSI*

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Here is a summary of Queensland OGMs and events:

12 March 2003 Speakers: Nicole Mathers Alan Barton Philippa Tolmie 2003 Student Night 24 members, 10 visitors

10 April 2003 Ron McDonald Memorial Lecture Neil McKenzie 39 members, 29 visitors

16 May 2003 "Vertosols, Vines and Volcanoes" Field Tour 65 members and visitors

**Ron McDonald Memorial Lecture** This year's Ron McDonald memorial lecture was given by Dr Neil McKenzie of CSIRO Land & Water, Canberra and Director of the Australian Collaborative Land Evaluation Program (ACLEP). The title of Neil's address was "Providing soil information to ensure technically defensible natural resource management in Australia - the scientific and institutional challenges".

ACLEP is entering its third phase and its major task is to take a major success of the National Land and Water Resources Audit - the Australian Soil Resource Information System - into an ongoing coordinated approach to a national information system which more effectively addresses the nation's emerging land management and environmental problems. Throughout its 10 years, ACLEP has provided a useful model for how national coordination can be achieved (and implemented during the audit) where previously state priorities had produced an information situation similar to the state rail gauges. We still have major challenges and Neil's seminar drew on the experiences of ACLEP and the audit to suggest future strategies.

The lecture was hosted by the Queensland Branch of the Australian Society of Soil Science and commemorates Ron McDonald, an eminent Queensland soil scientist who pioneered national standards in land resource assessment.

## **"Vertosols, Vines and Volcanoes" Field Tour**

Sixty five participants attended a very successful field trip held on Friday May 16, organised by Andrew Biggs. Two buses, one from Toowoomba and one from Brisbane, converged on the first site - Darbalara - in the Lockyer Valley. Those travelling from Brisbane were treated to some historical anecdotes from Bruce Carey, who is warming up for the ISCO conference tours next year. Cameron Wearing, a PhD student at University of Queensland Gatton, spoke at Darbalara, on the topic of reclamation of sodic soils using Japanese power industry by-product gypsum. Roger Swift provided some interesting big picture comments on carbon credits and the Japanese power industry. After muddying their feet, the group proceeded up the road to the Gatton Bypass where Kathryn Mahony from Main Roads Department gave some insights into the world of civil engineering and road construction, and their newfound interest in sodic and saline soils.



**"Vertosols, Vines and Volcanoes" Field Tour** Last stop of the day. Disposable overboots had to be worn at Kingsthorpe Research Station as part of quarantine protocol for wheat mosaic virus. Rather fetching aren't they?!

## ***Queensland soil scientists on a field tour***

“Vertosols, Vines and Volcanoes” Field Tour participants lined up at the bar to taste Preston Peak wines before lunch.



### ***Victorian Branch- Future Activities***

Soil Surveying Symposium--Current Practices and Future Directions  
3 October 2003 Department of Primary Industries, Tatura  
Contact: David Burrow or Aravind Surapanen (03) 5833 5222  
David.Burrow@dpi.vic.gov.au  
Aravind.Surapaneni@dpi.vic.gov.au

## ***IUSS Information***

Commission C1.1 Soil Morphology, which includes the existing Sub-Commission B (Soil Micromorphology), will be holding the 12th International Meeting on Soil Micromorphology at the University of Cukurova, Turkey, September 20-26 2004. A range of training workshops and excursions have been planned. Contact Professor Selim Kapur (kapur@cu.edu.tr) and/or visit the following web site: <http://ziraat.cu.edu.tr/imm/index.htm>

Geoff Humphreys  
Chair, Commission C1.1

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[www.iuss.org](http://www.iuss.org)***

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15th SEPT 2003  
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**Include news,  
thesis abstracts,  
ideas,  
information,  
conferences etc.**

# *New Members of ASSSI* **NEW MEMBER**

## **Welcome to ASSSI**

(approved Federal Council Meeting No 212)

Dr. Janet Hussein - QLD

Areas of specialisation: Vertisols - soil water interactions & irrigation management; conservation tillage - smallholder agriculture; soil water / potential measurement, groundwater recharge, water quality in smallholder irrigation systems

Mr. Sam Stacey - SA

University of Adelaide, School of Earth & Environmental Sciences

Areas of specialisation: Irrigation Science/management  
Fertilizer management

Mr. Peter Kopittke - QLD

University of Queensland

Areas of specialisation: Rhizosphere pH and nutrient availability High pH and plant growth

Mr. Paul Smith - NSW

Department of Sustainable Natural Resources

Areas of specialisation: Education Extension Advisory services, Soil conservation earthworks

Dr. Jagadish Timsina - NSW

CSIRO Land & Water

Areas of specialisation: Soil and plant nutrition; Soil water management; Soil, plant, water, atmosphere relationship

Ms Lucinda Gleadow - VIC

Monash University

2002 Frank Gibbons Award winner

Renewals by previous members

Dr. Kylie Hailes QLD

Mobil Oil Australia P/L

Areas of specialisation: Acid Soil Soil Contamination Soil remediation

Mr Jason Perna QLD

University of Queensland

## **PROFILE Peter Kopittke**

Hello to all members, my name is Peter Kopittke. After graduating from Bachelor of Land Resource Science in 2000, I am now nearing completion of my PhD at the University of Queensland under the supervision of Neal Menzies. My research has focused on 'factors limiting plant root growth in highly saline and alkaline bauxite residue', a project in cooperation with Alcan Gove, NT. Studies have been based in alkaline conditions and have largely been conducted using a solution culture technique which allows such studies with only negligible nutrient loss from solution (even up to pH 10.0 with a near-complete nutrient solution). Several growth limiting factors have been examined, including: the toxicity of the aluminate ion, Na- and Mg-induced Ca deficiency, and effect of Mn deficiency on rhizosphere acidification. My areas of interest include plant metal toxicities, soil fertility, plant mineral nutrition stress and adaptations, and the plant rhizosphere.

### **Complete Author and Subject Index Australian Journal of Soil Research**

Volumes 1 to 40 (1963-2002)

### **Journal of Soil Conservation Service of NSW**

Volumes 1 to 44 (1945-1988)

### **Australian Journal of Soil and Water Conservation**

Volumes 1 to 10 (1988-1997)

These Journals have been indexed on Author and Subject/Keywords and are being made available to Libraries, Researchers, Consultants and anyone wishing to locate relatively obscure data in their field of interest.

The Australian Journal of Soil Research index contains 1,971 articles. The Journal of the Soil Conservation Service index contains 1,305 entries and provides a means of retrieving considerable historic information on the soils, vegetation and land of NSW. The Australian Journal of Soil and Water Conservation contains 302 articles encompassing soil, water and land management throughout Australia.

**These electronic, searchable indexes are available in the following file formats:**

**Procite 5 and EndNote bibliographic systems; Access; Excel; and Word or Acrobat (both with Author and Subject listings).**

**Prices** AJSR A\$47 (US\$32) ea.  
(include post & packing) JSCS A\$36 (US\$25) ea.  
AJSWCA\$25 (US\$18) ea.

**Payment by cheque/money order or credit card via PayPal.**

Available from:

**Colin J Rosewell, PO Box 46, Gunnedah NSW,  
Australia 2380**

## **GC Stephens PhD Award in Soil Science**

**Nominations have closed and  
the winner will be announced  
later in the year.**



## *From the Newsletter Editor*

### *Lyn Abbott*

Thanks to everyone who submitted articles in time for this edition of Profile. It is pleasing to see lots of activity by ASSSI members. Please send information for the September Issue of Profile by 16th September.

You will notice that as a result of the information supplied by members, the length of this edition of Profile has increased from 32 to 36 pages (an increase in multiples of 4 pages is necessary for the printed copy). I hope that you will continue to give me items of interest for other members of ASSSI is that we enliven information flow across the country. We have also included information from the General Secretary of IUSS, Professor Stephen Nortcliff, which gives us a broader perspective of our involvement as members of IUSS. Also, we are trying to get information from IUSS Commission members - thanks to Geoff Humphreys for supplying information about Commission C1.1 Soil Morphology in time for this edition of Profile.

**PROFILE IS  
AVAILABLE ON  
THE ASSSI  
WEBSITE  
[www.asssi.asn.au](http://www.asssi.asn.au)**

### **Letter to the Editor – *Predicting Soil Distribution* Poster**

As the authors of the poster *Predicting Soil Distribution*, we wish to respond to Dr Bramley's letter on this product as appeared in the last edition of *Profile*. We believe he has been unduly critical and disagree with many of his assertions. He appears to have failed to understand the intended purpose of the poster and to interpret the predictive charts correctly.

The poster was primarily prepared as an educational tool, to assist understanding of soil formation concepts and in formulating models of soil distribution over an area. Its value was recognised by both the Science and Geography Teacher Associations who sought copies for their 8000 members around the country. Presenting soil science concepts in a relatively straightforward manner, allowing non-soil professionals to understand them, is in accordance with many ASSSI objectives. The poster was never intended to substitute for proper soil mapping where site-specific information is required, a point we emphasised in the supporting journal paper and technical report (as referred to in the footnotes).

Dr Bramley appears to be somewhat confused about which parent materials the charts on the poster apply to. It is clearly indicated that these charts only apply to silica-based parent materials; hence the y-axes range from *extremely siliceous* to *ultramafic* (with examples of each category given in Table 1). It should have been evident from the outset that the charts were not going to neatly apply to the calcareous materials he was dealing with.

However, his uncertainty about the application of the poster to "non ancient" landscapes may be valid as this was an issue we ourselves struggled with. Although the actual predictive charts do not apply well in ancient landscapes (ie, much of central and Western Australia), the broad concepts as discussed in the text boxes are universal and thus do apply there. We initially did include a map identifying the extent of ancient landscapes in Australia, but later chose to omit it and be less specific about areas of poster applicability.

As mentioned by our Federal President Cam Grant in his response, the poster did in fact receive extensive peer review, as did the supporting publications. Comments on the poster were sought from every State Branch of ASSSI and important modifications made as a result. Most of the soil photos were provided by the Branches, either directly or indirectly.

We have always expected, and in fact welcomed, critical feedback and advice on the poster and supporting publications. Attempting to present a relatively simple model on the complex science of soil distribution was always going to stir up reaction. But the majority of feedback to date has been most positive with very few significant changes proposed. We continue to seek constructive advice that may help to improve the predictive models, for example, advice that Calcarosols might extend into higher rainfall zones than the charts indicate, or that other soils occur over ultramafic materials.

Dr Bramley may be interested to learn that an international version of the poster (using the World Reference Base soil classification scheme) presented at the World Congress of Soil Science in Bangkok last year won the award for Best Poster in its Symposium and received overwhelming interest from delegates. Senior representatives of the IUSS wish to collaborate with us to formally publish an international version of the poster, plus supporting papers. We hope that this helps to somewhat allay Dr Bramley's concerns about the poster reflecting poorly on the professional image of ASSSI.

Jonathan Gray ([jgray@dlwc.nsw.gov.au](mailto:jgray@dlwc.nsw.gov.au)) and Dr Brian Murphy ([bmurphy@dlwc.nsw.gov.au](mailto:bmurphy@dlwc.nsw.gov.au))  
NSW Department of Infrastructure, Planning and Natural Resources



# ***SUPERSOIL Conference***

## **Australia & New Zealand Soil 2004 Conference**

### **5-10 December 2004**

Planning is well under way for the SuperSoil Event at the University of Sydney from 5-10 December 2004. The Conference will be held at the Eastern Avenue Complex, which is a state-of-the-art conference venue in a beautiful setting only minutes from the Sydney CBD, and in close proximity to the International/Domestic Kingsford Smith Airport.

Accommodation has been reserved for delegates at the new University Village on the campus. There will be opportunities for delegates to present oral and poster papers, which will be of full paper length, refereed and published in the official Conference Proceedings. There will be awards for "Best" papers, particularly for students and younger scientists. Top line Keynote Speakers will be a feature of the Conference.

A variety of pre- and mid- conference tours will be offered. Preparation of tour itineraries and their technical content is in progress. An excellent social program for delegates and partners is being prepared. Child minding facilities on campus will be available. Plans are underway for an outstanding event which will highlight the importance of soil in the environment and for the everyday well-being of the community, with extensive media coverage, on World Soils Day, at the commencement of the conference.

The Conference will present an excellent opportunity for delegates to network with national and international soil scientists.

The SuperSoil Conference will be a "must attend" event for everyone who is interested in soil science. Mark it in your diary today. Students could begin approaching their local ASSSI and NZSSS contacts for information on student travel grants. The first announcement will be mailed out, and posted on the ASSSI, NZSSS and ICMS websites, at the end of July 2003. ([www.asssi.asn.au](http://www.asssi.asn.au), <http://nzsss.org.nz>, [www.icms.com.au/supersoil](http://www.icms.com.au/supersoil)).

Graeme Tupper, Convenor, SuperSoil ANZ Conference 2004, [graeme.tupper@agric.nsw.gov.au](mailto:graeme.tupper@agric.nsw.gov.au)

## ***News from the NSW Branch***

NSW Soil Science Society Branch is booming. We have taken under our wing, at least on a temporary basis, all Australian Capital Territory Branch Members. ACT members will be receiving copies of our quarterly newsletter Cornstalk Media. Welcome ACT members! We hope to share some joint activities. We have designed a generic poster for general display at venues such as conferences. Other Branches are encouraged to use the poster or to modify it. Most of the photos in the poster are from NSW. The poster has ignited enthusiasm for a soil photo competition. There will be two categories: 'Soils' and 'Soils and People'. Amongst other ideas, we hope to have the best/winning entries on display at the Australia and New Zealand Soil Science Society Conference to be held in Sydney in early December 2004. Graeme Tupper, the conference convenor, has been firming up arrangements for the big conference. We don't get to host the Australian New Zealand Soils Conference very often. Several meetings have taken place with the commercial conference organisers and many of the subcommittees are either established or have already met.

In May twenty three members and visitors attended a highly successful two and a bit day field trip looking at soils in the Lachlan Valley. We visited leading farmers to see soils which are improving dramatically in structural condition under controlled traffic and raised beds. Jojoba plantings, rehabilitated wetlands, irrigation channels, a geological core description shed, weirs and a salt affected pub basement were inspected as well as a range of interesting soils exposures. We compared the country with explorer John Oxley's descriptions and even inspected an armed holdup site. Many thanks to Brian Murphy, John Lawrie, Fletcher Townsend, Jon Gray, Andrew Glasson and Ian Packer for organising the excursion. We are already looking at the next excursion which is shaping up for a three day event in the new england area. I think that all who have been on our field trips considers them to be: excellent value (tax deductible), enjoyable (friendly and social) and educational (interesting sites, people, soils and issues).

At our last branch meeting, on world environment day (5th June) we were addressed by Trevor Gibson. Trevor heads up the Organic Waste Recycling Unit which is involved with the science and regulation of soil and organic soil applications. There are many issues to be dealt with as the range and diversity of 'waste products' from manufacturing increases. We also enthusiastically discussed arrangements for a series of in depth and analytic soil profile examinations by learned soil scientists to share with other soil scientists. Ben Macdonald, Richard Bush and Leigh Sullivan are working on the details. The descriptions and discussion will be recorded and placed in public access- say on branch web pages. Our next branch meeting will be held on the 29th of August. Dr Alfred Hartemink from IUSS will be our guest speaker. After the meeting we will be having a social soil science meal at a local restaurant.

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## ***PhD Thesis Abstract*** by Stuart Boucher

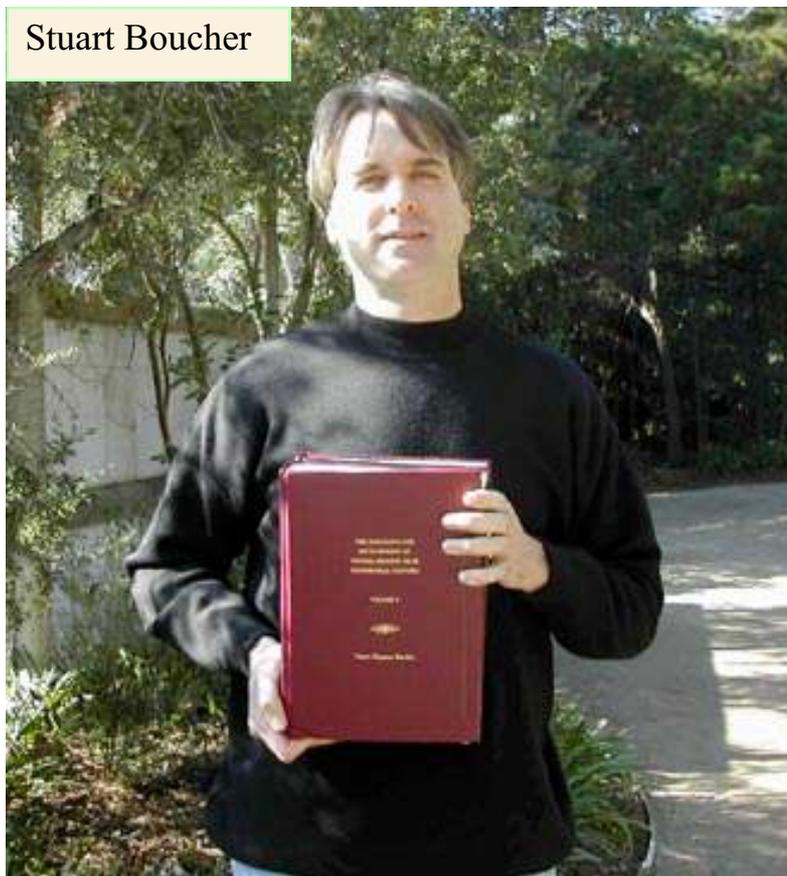
School of Geography and Environmental Science, Monash University, Clayton, Victoria.

### **The initiation and development of tunnel erosion near Costerfield, Victoria. 2003**

This thesis is a pioneering study of the origin and hydrology of tunnel erosion in the Heathcote area of semi-arid north-central Victoria, the aims being to understand the processes of tunnel initiation and development. In the study area of approximately 1 km<sup>2</sup>, a non-tunnelled hillslope under cover of forest was compared with severely tunnelled and adjacent non-tunnelled hillslopes on which widespread clearing had commenced in the 1880s, with a view to identifying the factors involved in the onset of this form of erosion. The approach included a combination of *in situ* infiltration studies, weir gauging of tunnelflow and sediment transport together with laboratory analyses of intact soil cores to determine the pore size distribution and Saturated Hydraulic Conductivity of samples. The characterization of soils was augmented by a detailed assessment of physico-chemical soil properties which were known to strongly affect clay dispersibility, such as the Sodium Adsorption Ratio (SAR), Magnesium/Calcium, Electrical Conductivity and Organic Carbon.

It was established from historical records that gully erosion was present in the area in the 1880s and tunnel initiation was known to have begun prior to 1900. The soils on the upper slope segments of tunnelled hills were highly permeable, especially on grassed areas and served as points of enhanced water entry into the subsoil. Tunnels were initiated in the B<sub>2</sub> horizon of soil profiles which exhibited a strong texture-contrast, and were generally classified as low-sodic (i.e. SAR<sub>1-5</sub> < 3). The location of tunnels in transects across a network did not always coincide with the most spontaneously dispersive soil material, either in the transect or the profile in which the tunnel was found, and this outcome was supported by statistical analyses. Whilst slaking of soil aggregates was observed in varying degrees throughout samples taken from the study area, it was the percentage of spontaneously dispersed clay estimated after 20 h which proved to be a discriminating factor between tunnelled and non-tunnelled hillslopes. Hydrograph analyses corroborated by field observation demonstrated that ephemeral tunnelflow was the dominant hydrologic pathway on affected slopes. The short lag times between peak rainfall and peak tunnelflow provided evidence that the water was 'new' and had by-passed the soil matrix through macropores, as the soils did not tend to crack. Although occurring on adjacent hillslopes with different slope aspects and lengths, the main branches of two tunnel networks were found to have reached a similar stage of development in terms of tunnel volume (m<sup>3</sup>) per lineal metre. On one hill, the equivalent tunnel density over the affected area reached 38.6 km/km<sup>2</sup> and, despite the process having had such a long history in the area, networks remained highly active with the greatest annual increase in the cross-sectional perimeter of a branch approximating 40 %. Other components of the study included comprehensive analyses of historical data on the local environment and land selection records for the allotments as well as a detailed, cost-effective reclamation proposal. The Costerfield district contains the most intensively researched sites of tunnelling in Australia.

Stuart Boucher



### **Request for information**

I am trying to locate a soil scientist who may have had experience in treating groundwater with high sodium bicarbonate contents. The coal seam gas industry produces water as part of the process of degassing coal seams. Much of this water is relatively high in sodium bicarbonate and as such is unsuitable for irrigation purposes unless treated. Currently this produced water is placed in evaporation ponds. Sulphurous acid can be used to reduce the bicarbonate content by releasing CO<sub>2</sub> however I am uncertain as to what happens to the sodium ions. The sodium ions are the villains as they cause the clay particles to disperse and consequently destroy the soil structure. The challenge seems to be how to prevent the sodium ions bonding to the clay particles. I would be very grateful if you could advise a contact point within your association that may be able to assist.

Garth Evans; Evans Energy Pty Limited  
14 Glanmire Street, Paddington, Qld 4064  
Email [evansgr@bigpond.net.au](mailto:evansgr@bigpond.net.au)  
Phone (07) 3368 2250 Fax (07) 3368 2251  
Mobile 0417 464 821

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## **OBITUARY: JOHN BUCKERFIELD**

It is difficult to write a short summary of John's life. By his mid-twenties, John had already established himself as an exceptional young scientist in the making. John was invited to present the results of his expeditions to the New Hebrides to study termites at the Royal Society in London. Few young scientists have been invited to do this. He received a Young Achiever of the Year Award for his outstanding effort and dedication.

John quickly rose through the ranks at CSIRO Division of Soils to reach the level of "Experimental Scientist". His work on termites continued and he made significant scientific contribution to the understanding of the role of termites in organic matter break down. His work covered many areas, but eventually settled into the study of earthworm ecology in agriculture. John established and tested the methods now used for the study of earthworms in agriculture, and began to see the significant impact of these creatures on soils and plants.

By the early nineties, John had certainly earned the nick-name "Worm Man". His studies to determine the benefits of earthworms in agricultural soils had seen him hand-sort more than 30,000 buckets of soil, each carefully sampled from pastures and crops across southern Australia. He was interviewed live-to-air at Adelaide Airport early one morning by an SAFM roving reporter, who had never seen anyone check a spade in with their baggage before.

John's research linked agriculture and the environment, and often contradicted popular thinking. Several studies showed that more intensive farming was not necessarily more damaging to the environment, but could in fact be better. Working closely with a school group at Kalangadoo, John helped the kids show that intensively cropped potato soils were in better condition than adjacent undisturbed pastures. His data on earthworm populations always had a story to tell. An article on his work in a Melbourne newspaper was used as the basis for Atkinson's daily cartoon.

John threw his efforts behind the Landcare movement, supporting farmer groups in conducting their own trials. He was living what is known today as "Research to Practice" - ten years before its time. He was immediately accepted by farmer groups, helped by his ability as an energetic, enthusiastic, humorous and engaging speaker. His presentations were noted for the multitude of carefully ordered slides he used, with the inevitable mid-talk carousel change... the occasional wayward slide popping spontaneously from the slide projector only made his presentations more memorable.

John's great skill was in being able to communicate his research to everyone. This saw him in demand for everything from international scientific conferences, to talk-back radio gardening shows, to Burke's Backyard and Totally Wild.

In a return to his childhood, John was lured back into the vineyards during 1995 by water-strapped Barossa vignerons. The local Landcare group had established trials with straw-mulch for water-saving, and wanted to measure effects on earthworm populations. But John took it further than that, and showed that with straw mulch, not only were earthworms increased, but water-use could be reduced by a third, with potential to increase grape yield as well. The impact of John's drive to investigate the full story told by his data can be seen today when driving through the Barossa vineyards - so many have straw mulch undervine.

His work with mulches in the Barossa put John onto the next stage of his career. In 1996, A double challenge was put to him. Firstly, to assist in an international agreement to drastically cut the amount of waste going to landfill. Secondly, to assist McLaren Vale wine-grape growers in adapting to significant irrigation restrictions.

John was approached to assist in developing uses for the materials which made up 30% of landfill - green-organics - the prunings, leaves and lawn clippings collected from households by local councils. Within weeks, John had established trials under 800 vines and 400 almond trees in McLaren Vale, with composted green-organics as a mulch for water-saving. Now seven years later, these trials have become landmark. The benefits of green-organics for water-saving, soil improvement, vineyard management and economic benefit were outstanding. The work has been replicated interstate, adopted by fellow researchers, and widely referred to.

During 1999, it became evident that John's workplace of 30 years, CSIRO, was changing. His skills as a soil ecologist were not seen to fit with the organisations new directions. News of his departure from CSIRO prompted a wave of support from groups and companies he had been working with, and it was this support that prompted him to establish his own consultancy. EcoResearch began operations on the first of January 2000, several days before his illness was diagnosed.

John was undaunted by his illness, and continued to achieve far beyond expectation. He had now become the man referred to as the expert on organic matter for soil management, particularly for water-saving. What greater challenge, than showing the Middle East how to use organic matter for water-saving, in the desert conditions of the orchards and market gardens of Saudi Arabia and the United Arab Emirates. John was able to demonstrate how little additional organic matter was needed to significantly save water - irrigation could be reduced from daily, to once every three days. Surely not even he could have expected such a dramatic result - though he'd never let you know it.

When John's health began to limit the extent to which he could participate in the vigorous field activity which was a feature of his work, he found other ways to ensure his involvement. The many casual workers who assisted him with winter sampling excursions and summer harvest activities would attest to the organised, generous and delicious morning and afternoon teas he would prepare. Coffee in hand, he would attend to the details, chat animatedly with the grower, and see that everyone was comfortable and catered for. The lunchtime address ensured that everyone knew the background to the work they were doing, and the significance of what they were now a part of. Everyone was included.



*Continued on Page 17*

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*Continued from Page 16*

Even in the last months of his life, John sought to put like-minded people together and participate in setting directions. He would often become so engaged in enthusiastically discussing his ideas with others, that any pain and tiredness would seem to vanish, replaced by a sparkling, animated energy that was infectious and inspiring.

His vision and energy in his work will continue to live, and in the very practical and measurable way he would have liked. Hundreds of thousands of tonnes of green-organics have been diverted from landfills across Australia over the last seven years, and put to better use for agriculture and the environment. John has had a significant effect on our environment, which will grow and persist for many years to come, to become a normal part of agricultural practice, and our daily-lives. - an impact you might remember next time you put out your recycling bin. And he was only one step away from showing them how to do it - Save the Murray that is - a challenge that will be taken on now by those inspired by his undaunted approach. His work will continue through EcoResearch (Contact 08 8339 3661).

John was an inspiring and surprising man. Those who knew him will miss his energy and enthusiasm, his welcoming, accepting nature, his attention to detail, his mischievous sense of humour, his warm, hearty handshake, and his big smile. John died on the 13<sup>th</sup> June 2003, whilst in the exceptional care of Daw House Hospice.

Katie Webster, July 2003

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## **RAISING THE PROFILE OF SOIL**

### **Suggestions from the ASSSI national FutureSoils Conference in Perth, 2002**

*continued from last edition of Profile*

101. Community awareness programs e.g. landcare
  - get people involved in looking at soils
  - get people who are not involved in a soil-based industry interested in learning about soils
102. Use media to spread the message: TV (Landline, current affairs), Radio (Country Hour), Newspapers
103. Short courses on soils at universities
104. World Soil Day - information sheets to be handed out in cities and towns.
105. Relate soils to other things. eg how it affects wine quality, coffee flavour (to get business orientated people interested).
106. Soil pit field days.
107. Land information workshops.
108. Workshops on environmental management systems.
109. Participating groups to look at soil problems where economic return to growers can be demonstrated while increasing or enhancing sustainability and conservation.
110. Work more with water-people are more concerned with water than soil or even food! People are concerned with water supply and quality - link to soils.
111. Work more with city and urban fringe - there are more people there.
112. Work more with school children - formative years for interests and attitudes.
113. Target city dwellers.

*Continued on Page 33*



Photo extract:  
Janet Wild

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# ***NEW MEMBER PROFILE***

Dr. Jagadish Timsina

CSIRO Land and Water, Griffith, NSW

Jagadish received his B. Sc. Agriculture (Hons.) from G.B. Pant University of Agriculture and Technology, India in 1979. He received M. Sc. and PhD in Agronomy (Crop Production and Management) from University of the Philippines at Los Banos, Philippines in 1984 and 1989, respectively. During his M.Sc. and Ph.D., he conducted his thesis research at the International Rice Research Institute (IRRI), also located at Los Banos. His M.Sc. thesis was on the effects of cowpea cultivars on the soil fertility and productivity of the succeeding crop of dry-seeded rice, and PhD thesis on the adaptability of cowpea cultivars to excess moisture and drought in rice-based cropping systems: experimentation and simulation. From 1994 to 1996, he did his post-doctoral research work, also at IRRI, on the modeling productivity and nitrogen dynamics of rice-wheat cropping systems in Bangladesh and India. After receiving the undergraduate degree in 1979, he was employed by the Institute of Agriculture and Animal Sciences (IAAS), Tribhuvan University, Nepal, where he worked as a Lecturer, Senior Lecturer, and Assistant Dean (Administration) at various times until slightly before he finally moved to Australia in January 1997. He worked with the University of Melbourne from January 1997 to December 2001 as a Senior Research Fellow and Project Coordinator of the Australian Centre for International Agricultural Research (ACIAR)-funded research on "Nutrient and water management for the sustainable rice-wheat cropping systems in Bangladesh and Australia". Jagadish joined CSIRO Land and Water, Griffith, NSW in January 2002 as a Senior Research Scientist (Agronomist/Modeller) and has also been working as a Project Coordinator of ACIAR-funded research on, "Permanent beds for rice-wheat and other irrigated cropping systems in north-west India and southeast Australia. He has also experiences on rice-wheat and maize-wheat cropping systems of China and has traveled China several times to understand climate, soils and those cropping systems.



Since joining CSIRO Jagadish has been involved in the greater understanding of the soils, climate and irrigated cropping systems in southern NSW and rice-wheat and other irrigated cropping systems in northwest India, and in rigorously evaluating, testing and applying simulation models for those environments. His skills are in water and nutrient management in cropping/farming systems, understanding of the cropping/farming systems of Asia, and evaluation, comparison and application of various crop simulation models originated from Netherlands, USA, and Australia. His areas of expertise in Soil Science include Soil Fertility and Chemistry, Soil Physics, and Soil Water Management. His current interests include modelling water and nitrogen interaction for rice-wheat and other irrigated cropping systems in Asia and Australia using CERES, SWAGMAN Destiny and Dutch models.

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*See Page 35 for  
Contact details*

## ***ASSSI Federal Executive 2003-2004***

President:	Dr Cameron Grant (SA Branch)
Vice President:	Dr Neal Menzies (Qld Branch)
Secretary:	Dr Annie McNeill (SA Branch)
Treasurer:	Dr Keith Lindbeck (WA Branch)
Newsletter Editor:	Prof. Lyn Abbott (WA Branch)

Branch Presidents are also members of Federal Council

ASSSI Federal Council  
meets bi-monthly via  
telephone conference  
in  
Jan, Mar, May,  
July, Sept, Nov.

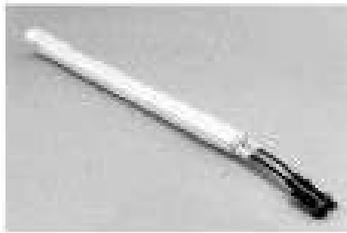
Queensland:	Mr Mike Grundy
New South Wales:	Mr Greg Chapman
Riverina:	Mr John Thompson
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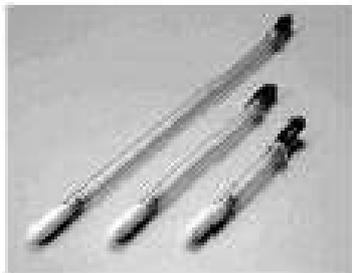
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# THE UNIVERSITY OF QUEENSLAND

## AUSTRALIA

### Lecturer in Plant Nutrition

School of Land and Food Sciences

Faculty of Natural Resources, Agriculture and Veterinary Sciences

An experienced post-doctorate scholar is required to teach undergraduate and post-graduate courses in plant nutrition and soil science, and to develop suitable research programs and provide supervision to postgraduate students in the areas of plant nutrition and soil fertility.

The School of Land and Food Sciences is a leading provider of undergraduate and postgraduate training in the areas of Agricultural and Environmental Sciences and Management in Queensland. It has strong and active research programs in Soils and Land Resources, and in Plant, Animal and Food Sciences.

The Soils and Land Resources Group is responsible for teaching Soil Science courses into Environmental Science, Agricultural Science, Resource Economics and Engineering programs. Major research activities of the Group cover the science and management of physically, chemically and nutritionally degraded lands including mined land rehabilitation, land application of solid and liquid wastes and natural resource assessment.

In the role of Lecturer in Plant Nutrition, you will participate in the teaching of courses in soil science and plant nutrition to 2<sup>nd</sup>, 3<sup>rd</sup> and 4<sup>th</sup> year students. You will also develop and pursue research programs related to the School's teaching and research activities; these may involve collaboration with other organisations. You will be expected to supervise 4<sup>th</sup> year projects and postgraduate students at the masters and PhD levels within your areas of research interest.

You should possess a PhD in Plant Nutrition or Soil Science, (or show evidence that a PhD thesis has been submitted), together with experience in either plant nutrition, soil fertility, whole plant physiology or soil chemistry.

This is a continuing, full-time appointment at Academic Level B. The remuneration package will be in the range of \$64,285 - \$76,338 per annum, **including** employer superannuation contributions of 17%.

Obtain the application details, position description and selection criteria from the Human Resources Officer, Faculty of NRAVS ([hr.nravs@uq.edu.au](mailto:hr.nravs@uq.edu.au)), The University of Queensland, Gatton Q 4343 or contact by telephone or email Associate Professor Bing So, (07) 3365-2888, [h.so@uq.edu.au](mailto:h.so@uq.edu.au) to discuss the role.

**Closing date for applications: 31 July 2003**

**Position Reference Number: 3008450**

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# ***NEW MEMBER PROFILE*** Christine Juergensen

My name is Christine Juergensen, and in 2000 I graduated from Osnabrueck University of Applied Sciences in Osnabrueck, Northwest Germany, with a BSc(Hons) in Soil Sciences. I am trained in general soil science as well as in assessing urban/industrial soils, contaminated sites and undertaking minesite rehabilitation. In 1999/2000 I spent 8 months at CSIRO Davies Laboratory in Townsville, Queensland, researching gully and sheet erosion in grazed areas in North East Queensland as part of my thesis. Prior to that I spent four months in Wales at Bangor University in 1998, researching phosphorous and nitrogen distribution on Bardsey Island, Wales, an island known for its abundance of birds and grey seals. Also, it used to be a cult place for druids and later a place of worship for Christians.

In October 2001 I was offered a position with the Department of Natural Resources and Mines in Ayr, Queensland, mapping soils in the Burdekin Delta, where I gained additional experience in soil mapping (especially deltaic soils), soil and land system data entry programs (SALI), extension work and in project administration. In January 2003 I commenced my current position as Land Resources Officer with NR&M in Indooroopilly/Brisbane as part of the ERA Salinity Team with Mike Grundy. My main responsibilities are setting up databases with land systems information and mapping soils and regolith as part of our project.

Christine Juergensen  
Land Resources Officer, Dept. of Natural Resources & Mines  
Indooroopilly QLD 4068  
[christine.juergensen@nrm.qld.gov.au](mailto:christine.juergensen@nrm.qld.gov.au)

The home page for AJSR is  
[http://www.publish.csiro.au/  
journals/ajsr/index.cfm](http://www.publish.csiro.au/journals/ajsr/index.cfm) and  
the contents page can be viewed at  
[http://www.publish.csiro.au/  
journals/ajsr/contents.cfm](http://www.publish.csiro.au/journals/ajsr/contents.cfm)

**ASSSI Website**  
**[www.asssi.asn.au](http://www.asssi.asn.au)**

# ***ASSSI Publication Medal 2003***

McElnea AE, Ahern CR, Menzies, NW 2002. Improvements to peroxide oxidation methods for analysing sulfur in acid sulfate soils. Australian Journal of Soil Research 40 1115-1132.

This paper was a thorough and meticulous piece of research, which provides an informative review of acidity and tackles a difficult and complex problem. The paper resolves a previously reported weakness in methods for assessing acid sulfate soils. It was easy to read and it describes an engaging trail of scientific inquiry. We found the writing style in the first person very appealing (as opposed to the dry and turgid third-person writing style that is so typical of current scientific papers). This paper, and its follow-up companion paper, make a useful contribution to evaluation and management of acid sulphate soils.

The Committee, which comprised Cameron Grant (as Chair, South Australia), Dr Phil Smethurst (CSIRO Tasmania), and Dr Richard Bell (Murdoch University, Western Australia), felt all of this years' submissions had high scientific merit and relevance to the soil science community (internationally) and were generally very well written. We can be proud that young Australian soil scientists are conducting research of such high quality and communicating it so effectively. All candidates should be congratulated on the high standard of their papers. The task of selecting the best was therefore not easy. Having said this, two papers were disqualified because the work appeared to be developed and conducted entirely outside Australia, and the ASSSI Constitution By-Law 28a is fairly clear on this - it might help if the By-Laws were published in Profile along with future calls for nominations.

The present Chair of the Committee (Cameron Grant) will be retiring shortly and passing the reins to Dr Phillip Smethurst, CSIRO Forestry & Forestry Products and a new committee member will need to be appointed.

**THE EMAIL ADDRESS  
FOR  
ASSSI Executive Officer  
Linda Bennison  
is  
[asssi@bigpond.net.au](mailto:asssi@bigpond.net.au)**

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# **PhD Thesis Abstract** by Shahab Pathan

Faculty of Natural and Agricultural Sciences, The University of Western Australia, Crawley, 6009, WA

## **Fly Ash Amendment of Sandy Soils to improve Water and Nutrient Use in Turf 2003**

Sandy soils pose a particular challenge for water and nutrient management due to the low water retention and ionic adsorption capacities of these substrates. Fly ash is comprised primarily of fine sand- and silt-sized particles so, if applied at sufficient rates, can change soil texture and improve soil water-holding capacity. Several sources of fly ash from Western Australia and Queensland, and two soils of the Swan Coastal Plain in Western Australia were evaluated for a range of physical and chemical properties. The sorption of  $\text{NO}_3^-$ ,  $\text{NH}_4^+$  and P, and leaching of those nutrients from fly ash amended soils, were assessed in laboratory studies. Field plots and lysimeters of Karrakatta sand were amended to a depth of 100 mm with four rates (0, 5, 10 and 20 %, wt/wt) of Kwinana fly ash (3 yr old weathered) and effects on soil properties, plant nutrition, turf growth and quality, and nutrient leaching were assessed during two consecutive summers in Perth, Western Australia (i.e., a Mediterranean-type climate).

The results of the characterization showed considerable variation in several properties among the samples. Soils were comprised primarily of coarse sand-sized particles, whereas most of the fly ashes were primarily fine sand- and silt-sized particles. Soil water-holding capacity was increased progressively with increasing rates of fly ash additions to the sandy soils, whereas hydraulic conductivity decreased. Extractable P in the fly ashes (except Tarong and Callide) were 20- to 88-fold higher than in the soils. The pH showed considerable variation (pH=3.8 to 9.9; 1:5 in 0.01 M  $\text{CaCl}_2$  extract) among the different sources of fly ash. The toxicity characteristic leaching procedure (TCLP) indicated that the potential for release of trace elements from the fly ashes were well below regulatory levels. The considerable variation in physical and chemical properties among the fly ash samples supports the notion that field trials are essential to the future development of soil amendment strategies making use of any particular source of fly ash.

Sorption of  $\text{NO}_3^-$ ,  $\text{NH}_4^+$  and P was higher for Kwinana fly ash (weathered and unweathered), than a sandy soil. Phosphorus sorption was greatest for unweathered fly ash, followed by weathered fly ash and then the soil, and desorption of P was much slower in the unweathered fly ash, than weathered fly ash or the soil. Leachates collected from columns containing soil amended (5, 10 and 20%, wt/wt) with Kwinana fly ash (3 yr old weathered) had lower concentrations of  $\text{NO}_3^-$  and  $\text{NH}_4^+$  than leachates from non-amended soil. Prior to adding fertilizer, the concentration of P was greater in leachate from fly ash amended soil than from the non-amended soil, due to Kwinana fly ash (3 yr old weathered) itself containing 92.5 mg  $\text{kg}^{-1}$  extractable P. However, from day 35 onwards, the concentration of P was lower in leachates from soil amended with 10% or 20% fly ash, than from non-amended soil. In field plots of Karrakatta sand amended with Kwinana fly ash (3 yr old weathered) to a depth of 100 mm, soil water-holding capacity increased progressively with increasing rates of fly ash addition. Turf (*Cynodon dactylon* (L.) Pers., cv. 'Wintergreen') planted as rhizomes had a 1.3- to 1.6-fold larger root dry mass in the top 100 mm after 63 d of growth in plots amended with fly ash when compared to non-amended plots. When planted with turf, leaching of  $\text{NO}_3^-$ ,  $\text{NH}_4^+$  and P were minimal (equivalent to <3% of total applied), so there was no significant effect of fly ash on nutrient leaching under turf. For turf grown in plots amended with fly ash, Se, and Cd showed small but statistically significant increases in leaf tissue concentration (increased from 0.13 to 1.35 and 0.14 to 0.16 mg  $\text{kg}^{-1}$ , respectively). However, the highest Se concentration was only 27 to 34% of the level (4.0 to 5.0 mg  $\text{kg}^{-1}$ ) considered to be detrimental, and the concentration of Cd was at the lower end of the range (0.1 to 1.0 mg  $\text{kg}^{-1}$ ) regarded as normal. The concentrations of As, Ba, B, Co, Cr, Cu, Pb, Ni, Hg, and Ag were not statistically different, or in some cases lower, whereas Mn and Zn had increased in leaf tissue from turf grown in fly ash amended compared with non-amended soil.

During the 2<sup>nd</sup> summer (when the turf had grown for ~ 12 months), plots were irrigated at 40% replacement of net evaporation summed and apply every 3<sup>rd</sup> or 4<sup>th</sup> d. Soil water contents were 14 to 33% higher in the fly ash amended soil zone (i.e., top 100 mm) when compared to values in plots with non-amended soil. Soil water content below the turf root zone (i.e., 1500 mm) during that period remained low (being only 1 to 2% above the permanent wilting point for this soil type), indicating minimal, if any, deep drainage. Extractable soil P was 2.0- to 3.8-fold higher in the fly ash amended soil, compared to non-amended soil. By contrast, extractable P was 1.7- to 2.1-fold higher in the 100 to 500 mm zone in soil samples from non-amended plots, compared with fly ash amended plots, when irrigated every 3<sup>rd</sup> or 4<sup>th</sup> d. Irrigation at 40% replacement of net evaporation summed and applied every 3<sup>rd</sup> d did not adversely impact on turf growth or quality and so may be a suitable watering schedule for maintenance of turf, with minimal risks of deep drainage.

In summary, amendment of sandy soils with fly ash, in combination with appropriate management regimes, may potentially increase turf growth and quality by reducing episodes of water deficit and via retention of nutrients in the root zone. The toxicity characteristic leaching procedure (TCLP) indicated that the potential for release of trace elements from the fly ashes were well below regulatory levels, and furthermore release of trace elements from fly ash amended soils *in situ* would be a very slow process, so ground water contamination is unlikely. The beneficial aspects of application of fly ash at moderate rates (i.e., 5 to 10%, wt/wt) to water and nutrient management in sandy soils are an encouragement to further explore the use of fly ash as a soil amendment.

Supervisors : Dr. Tim Colmer, School of Plant Biology, UWA

Professor Graham Aylmore, School of Earth and Geographical Sciences, UWA

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ASSSI Members will be able to subscribe to the Australian Journal of Soil Research via their 2003 ASSSI membership renewal. The cost will remain at \$80 for electronic and \$105 for paper, which is a discounted price for financial members of the society. If you have any queries please contact Linda Bennison ASSSI (Executive Officer) to take advantage of this offer.



# *ASSSI Federal Council Minutes 211*

*Confirmed at May meeting of Federal Council*

**Teleconference** Friday March 28<sup>th</sup> 2003

1.30pm WA, 4.00pm SA, 4.30pm Vic/NSW, 3.30pm Qld

**Opening:**

The meeting opened at 4.00 pm Adelaide time.

**Attendance** (alphabetical order):

Lyn Abbott (Profile Editor), Linda Bennison (Executive Officer), Graham Chapman (Pres NSW), Cameron Grant (Federal President), Mike Grundy (Pres QLD), Keith Lindbeck (Federal Treasurer), Neal Menzies (Vice President), Annie McNeill (Federal Secretary), Aravind Surapaneni (Pres. VIC), John Thompson (Pres Riverina).

**Apologies:** No apologies received

**Business arising from minutes of Federal Council Meeting 210**

Constitutional changes need to be addressed formally and submission drafted for next federal council meeting Action: Cam

Suggested follow up by Lisa Lobry de Bruijn to survey at WA conference - a question of whether further action worthwhile.  
Action: Lyn & Greg

**ASSSI Awards Committee.** Deadline needs extension from March 31<sup>st</sup> – suggested date June 30<sup>th</sup>; this needs to be advertised in Profile - Action: Lyn

**ISCO/ASSSI database:** Decided no change to current arrangement whereby Linda currently gets ASSSI names removed from ISCO list to avoid duplication. Acknowledged need to maintain privacy and avoid setting the wrong precedent.

Subscriptions & arrears. Cam thanked Linda for procedures and asks all local members to chase those members still non-financial. Action: All

Audited accounts & final statement for last conference still coming? Action: Keith

Are subs value for money? General agreement was yes. Queensland & Victoria no complaints. Riverina would like it held the same for next year. NSW says some members question IUSS fee but otherwise fine. WA OK. Aravind offered to contact Tasmanian member. ACT no longer has a branch so there is a need to align those members with Riverina or NSW. Future complaints received by Linda to be forwarded to President for response. Action: Linda, Cam

Complimentary membership to student with poster at 2004 conference?

If only offered to non-members might be seen as a disadvantage to students already a member. Overall a good idea. Neal says it might be better to offer a reduction in conference subs to a student that is equivalent to a membership (\$44, on top of the other reduction already offered for students). Suggestion: student members come for \$250 and new student members come for \$294?? What is under the constitution by-law 31H ? A clear example needs to be provided for next meeting. Action: Greg

**President's Report**

Attached (see Profile 133)

**Executive Officer's Report**

Attached (see Profile 133)

Keith Lindbeck (Hon. Treasurer) requested clarification of amounts. Action: Linda

Aravind has problem with link to Vic site from ASSSI website– speak with Webmaster Action: Linda

Report accepted

Awards certificates – Keith to follow up Action: Keith

**Secretary's Report**

Richard Harper requested to send archive files. Action: Annie

**Treasurer's Report**

Awaiting final paperwork on 2002 and conference – to be put in next Profile.

Still in black \$9-10K; IUSS paid; No accounts outstanding. Branch dues to be paid in week after Fed meeting  
WA, SA, NSW and Vic branches have sent in audited accounts.

**Profile Editor's Report**

Call for pictures. Article to come on recent field trip to Tasmania (Vic branch) Action: Aravind

Biography material for 2002 Prescott & Hon. Life Members winners Action: Cam

*Federal Council Meeting 211 Minutes Continued on Page 25*

### Branch President's Reports

Vic: Profile article will cover major issues: Tas trip and next *Leeper Lecture* will be Bob White 21 Nov 2003 Action: Aravind

Riv: John to send Annie details Action: John Thompson

Qld: Meeting held to award Calvin Rose Hon. Life Membership; Young Professionals Meeting held; *Ronald McDonald* talk to be held 10<sup>th</sup> April.

SA: Special meeting to be held to present Prescott & Hon Life Memberships –report next FC meeting. Action: Cam

NSW: Meeting held 7<sup>th</sup> March at which Linda spoke. A conference organiser has been selected for 2004 conference. May 16-17<sup>th</sup> field trip. Next meeting on 5 June at Paramatta

Request by Cam for short reports in future in advance of meeting. Action: All

### General Business

2002 Conference see treasurers report

Promoting soil science - follow up

Promoting soil science – follow up to conference ideas (Lyn) Some in profile already; some in next issue. Process for action on these? Should those with good ideas be encouraged to act on them – but how since no names on the sheets. Can the ideas be categorised? Follow up required Action: Lyn

IUSS Fees for members of more than one soils society. Stephen Nortcliff informed – await his response

Subscription fees – value for money for all members?

See business arising from previous minutes

Accreditation of Soil Science Courses/Teaching in Australia

Accreditation of Soil Science Courses and/or Teaching. Can ASSSI accredit individuals for teaching soil science or entire soil science courses. Question is should it be taken to accreditation committee or considered further? Key terms of reference would be good to facilitate discussion. Focus on graduate attributes that courses hope to confer. Lyn will write a short report for consideration at next meeting Action: Lyn

Complimentary member ship for students presenting poster at 2004 conference

See business arising above

ASSSI Soils Conference information on the Website (accessible to Members Only)

Linda asked Fed Exec members to assess the Vic Grassland Soc. website (<http://www.grasslands.org.au>) as suitable template and an example of features that can be incorporated into the ASSSI website e.g password access is being developed, host server changed to Optus, search function. Linda would like some feedback Action: All

ISCO conference link on front page needs to be approved by Fed Council Mike requests message to Derek Action: Annie  
ISCO site is old but being revamped so will need to keep him updated via Lydia Dalton.

ASSSI Rep on AJSR Cam Grant confirmed that ASSSI Rep on AJSR is Andrew Rate; AJSR Editor already aware of this.

### Other business

New members list:

Cam moved acceptance, Annie Seconded, new members list accepted.

Poster on ASSSI prepared by Greg. Would like some feedback and photos.

Aravind asked for ASSSI Publication Medal Guidelines –in ASSSI Constitution

Lyn informed that a Farmer group and the Shire of Kojonup has established the Kojonup Soils Centre at Kojonup WA to promote interest and knowledge of soils. The Centre will include a soil science laboratory and an education facility.

Linda – Are 2002 Perth Conf. Proc. still available for purchase? Action: Linda

### Close

Meeting closed at 5.30 pm SA time

Next Meeting Federal Council 212, 30 May 2003. 3.00pm SA time (1.30pm WST)

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## *Riverina Branch Field Trip*

The Riverina Branch's regular 'quarterly' meeting was held at Yanco on the 20th June. Following the business meeting the members were entertained by two speakers. Geoff Beecher, discussed aspects (soil related where possible!) of his recent study tour of the ricegrowing areas of Argentina, Brazil and Uruguay. The water supply is mainly rainfed, supplemented by groundwater.

Rice is grown on a one year in three rotation and in many cases rotated with pastures for beef production. Inputs seemed to be on the conservative side as market outlets, price etc were unpredictable. Also the rice sharefarmer was reluctant to expend on inputs that may be more beneficial to the subsequent pasture than his current rice crop.

Robyn Neeson described the history of the organic farming demonstration site at Yanco Agricultural Institute, including its successfully accreditation. A number of summer crops have been grown in rotation with a green manure crop and 'imported' compost. The future of the site is uncertain as they explore avenues for further funding - an ongoing issue for many scientists. Members then inspected the field site where many questions were answered by Tobias Koenig and Robyn.



Mark Conyers, vice president of the Riverina Branch, contemplates the soil structure! Photo: Janet Wild

Below: Members of the Riverina Branch inspect the organic farming demonstration site at Yanco Agricultural Institute. Photo: Janet Wild



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## Book Review

**Mine wastes : Characterization, Treatment and Environmental Impacts.** 277 pages, hard back published 2003. Springer ISBN 3-540-00526-9.

Author: Bernd Lottermoser, James Cook University, Qld.

Australian soil scientists feature strongly in world literature on mine rehabilitation although much of this work relates to the plant biology and mineralogy of revegetation. Indeed many workers in this field have backgrounds in biology, agriculture or environmental science so are poorly prepared for the complexity of the earth **materials** that they must manage. Dr. Lottermoser's book **remedies** this deficiency by providing detailed descriptions of ore types and associated rocks, mining, processing and waste disposal practices for desire mining operations. There is a focus on the problems and management of sulphidic mine wastes but mine tailings, **cyanidation** residues and radioactive, phosphate and potash mine wastes are also considered in detail.

The book describes the geological setting, mineral and chemical properties of ores together with mining and processing operations and the wastes for the most common types of mining operation. It **is particularly** valuable in the **thorough** explanations of complex chemical reactions and appropriate management relating to each waste type. Handling and health hazards of **diverse** wastes are considered and throughout explanations are reinforced by examples and by chilling lists of past disasters. Explanations are supported by photographs, unfortunately but economically in black and white, and **drawings**. The book refers to management problems associated with **adverse physical** properties of wastes but topics such as sodicity, dispersion slaking, erosion and compaction are not treated in the same depth as the geological, mineralogical and chemical features of wastes. Similarly although the role of biological process in the management of waste is **identified** this area is not strongly developed.

This book will be invaluable to engineers, rehabilitationists, mine managers, regulating professionals and students who do not have an adequate background in geological materials and the chemical behavior of mining and processing wastes. The strong use of Australian and Asian examples is an additional strength as much as North American and European literature in this field relies on example which do not relate well to Australian conditions.

Professor Bob Gilkes  
Director Center for Land Rehabilitation  
University of Western Australia

**Centre for Land Rehabilitation**

**Check web site for training courses:**

**<http://www.clr.uwa.edu.au>**

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## NATIONAL GEOGRAPHIC'S NEW GLOBAL EXPLORATION FUND SEEKS NOMINATIONS FROM AUSTRALIA & NEW ZEALAND'S BEST SCIENCE, EXPLORATION & CONSERVATION PROJECTS

(Sydney: Thursday 26th June, 2003) - The National Geographic Society today launched its exclusive Global Exploration Fund in Australia further extending its century-old grant-making program to identify and nurture outstanding local projects.

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National Geographic's scientific grants program which began in 1890 has made history over the years by supporting such recipients as naturalist Jane Goodall; underwater explorer and Titanic-discoverer Bob Ballard; world-renowned Egyptologist and Archaeologist, Dr Mark Lehner; Geneticist and Author, Dr. Spencer Wells PhD; palaeo-anthropologist Louis Leakey and Australian-based palaeontologists Dr. Thomas Rich and Professor Patricia Vickers-Rich.

To date, the National Geographic Society has supported more than 7,000 significant projects world-wide. In Australia and New Zealand, Dr. Tim Flannery, Director of the South Australian Museum will act as International Advisor of the Global Exploration Fund to direct the local program, identifying and considering potential Australian and New Zealand submissions in conjunction with the three grant-making bodies of the National Geographic Society: the Committee for Research and Exploration, the Expeditions Council and the Conservation Trust.

Australia and New Zealand join five other countries - Mexico, Portugal, Germany, Austria and Switzerland in launching the new program.

Proposed projects must have both a geographical dimension and/or relevance to scientific fields and applicants must have advanced degrees (Ph.D. or equivalent) and/or be associated with an educational organization or institution. Applications are open in the disciplines of anthropology, archaeology, astronomy, biology, botany, geography, geology, oceanography, palaeontology and zoology. Multidisciplinary projects that address environmental issues (e.g., loss of biodiversity and habitat, effects of human-population pressures) are of great interest.

For further information see:

[www.nationalgeographic.com.au](http://www.nationalgeographic.com.au)

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## *Honorary Life Membership of ASSSI to Dr W.W. Emerson, BA, PhD*

Dr Emerson was born in London, England, where he received most of his education. He was a Scientific Officer in the soil physics department at Rothamsted (1949-1957), after which he came to Australia to work with CSIRO Soils in Adelaide. He was awarded a Rockefeller Fellowship in 1961 to help set up the USDA-ARS soil structure laboratory in St Paul, MN. He was invited to give a series of postgraduate lectures in soil physics at University of Missouri, CO in 1969. In 1987/88 he helped the International Rice Research Institute in Manila, Philippines to develop a program to improve soil structure for dryland cropping after rice production. After he retired (1990) he continued to pursue and publish his research for an additional 10 years. His latest paper appeared recently in the *Australian Journal of Soil Research*. He served as president of ASSSI-SA Branch (1973), president of the Australian Clay Minerals Society (1981-83), and secretary of the organising committee for the 9<sup>th</sup> Congress of ISSS in Adelaide (1968). He was senior editor of the widely acclaimed book "Modification of Soil Structure" published by John Wiley & Son, London (1978). He was awarded the ASSSI Prescott Medal in 1992. A summary of his scientific achievements, prepared by Jock Churchman, Rob Fitzpatrick and Richard Merry, is given below.

Dr Emerson took an individual, highly innovative path during his long career in soil science. His career spanned the highly contrasting physical environments of the British Isles and Australia but the outcomes of his work have produced understanding and practical tests that have proved useful for all soil environments over decades, and continue to do so today. His achievements generally relied less on sophisticated instruments than on clear insight and a probing, intelligent questioning – hence the lasting nature of his scientific perceptions and practical approaches to important soil problems

His training was in physics and his early professional experience was within the strong soil physics group at Rothamsted, England. His work focused on the relationships between the strengths of interparticle bonds and the resistance of soil structure to breakdown upon wetting, and his conceptual model for soil aggregation continues to provide starting points for new research. His work led to the idea of the "chemical hammer", based on the use of sodium ions to test the strengths of interparticle bonds. Importantly, this work was carried out in England, a comparatively young landscape where salts hardly occur in soils. However, it was highly prescient for his forthcoming move to the ancient salty Australian landscape. In his English work during the 1950's, he anticipated, by about 40 years, the rush of enthusiasm for research on the sodic soil problem, which so strongly limits agricultural production on more than 25% of Australian arable soils.

Dr Emerson applied modern techniques to some pioneering studies on the complexes formed between pure clay minerals and organic compounds at the nanometre scale. This work led to papers in *Nature* in 1955, 1957 (twice) and in 1960, and some of his work on structure was also reviewed by others in *Nature* in 1959. Hence this physicist, whose best-known work (on soil structural stability) used concepts based in physical chemistry, also made significant early advances in clay mineralogy. In the area of clay-organic complexes in soils, he was typically ahead of his time by about 40 years when he published a group of seminal papers on organo-mineral structures in the 1970's with Drs Phil Slade and Max Raupach. Dr Emerson proved here, as in his soil structural work, that he has been a scientific pioneer, albeit one whose achievements have often been unsung (largely because of his inherent modesty and tendency to praise and promote the work of others rather than his own). Nevertheless, Dr Emerson is one of those rare scientists after whom an important diagnostic tool was named – a standard recognised internationally as the *Emerson Dispersion Test*. The widespread value and appeal of this test has made it broadly applicable outside traditional soil science. It finds particular use in engineering for geotechnical applications such as in the assessment of the stability of earth dams. Indeed, he made many practical and fundamental contributions to geotechnical engineering - one of his earliest studies in CSIRO (1959) concerned the sealing of earth dams, and this interest continued through to his retirement.

The later part of Dr Emerson's formal professional career was spent within the Minesite Rehabilitation Group of CSIRO Division of Soils, where he studied the stability of minesite materials. He also made useful contributions in the clarification of wine (1963), the transport of environmental pollutants (1974), and the structure of soils used for rice cultivation (1985, 1987). Dr Emerson never sought honours or recognition as the motivation for his work, yet he was widely respected in the soil science community and is truly a worthy candidate for Honorary Life Membership in ASSSI.

**FOR INSURANCE  
PURPOSES  
REMEMBER TO  
NOTIFY FEDERAL  
EXECUTIVE  
(Keith Lindbeck)  
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ACTIVITIES**

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# *New Project to Boost Field Crop Production in Cambodia and Australia*

Richard Bell, at Murdoch University, WA, heads a new 3-year project funded by the Australian Centre for International Agricultural Research (ACIAR) that will assess land suitability for crop diversification in Cambodia in Australia. The main collaborator at the Cambodian Agricultural Research and Development Institute will be Dr Seng Vang who completed his PhD at Murdoch in 2000. The Western Australian Department of Agriculture will also collaborate in the project, on a related activity to assess land suitability for pulse crops in WA.

Cambodia has predominantly a rice-based agricultural economy. Since 1987, there have been concerted programmes to rebuild the rice economy, following the devastating years of civil war. Whilst Cambodia has not yet produced the large surpluses of rice that were exported in the 1960's, it has returned to rice self-sufficiency consistently for the last 4-5 years. Rice yields continue to increase, even though they remain low by SE Asian standards. Having placed rice production on a firm footing, Cambodian agriculture is now looking to diversification. Diversification is needed in the lowlands to boost overall productivity in the rice-based seasonally flooded lowlands. This might involve growing field crops in the early wet season or after the harvesting of rice. Supplementary irrigation would be needed in both cases since the rainfall in most of Cambodia, outside the main rice growing season (July-November) is low or erratic. A research programme is planned by Murdoch University and CARDI to determine the main constraints to field crop production in the lowlands. This will then be coupled with an assessment of socio-economic factors that might determine what crops are suitable for different soils.

By contrast with the lowlands of Cambodia that have been cultivated for rice for centuries, the uplands are not extensively used for agriculture. As population grows there will be pressure to develop the upland areas as has happened in Thailand and Vietnam in the past 2-3 decades. Areas most likely to be developed are those where soils are relatively flat and the land is accessible to roads and markets. However, relatively little is known about these landscapes and their soils and their capability for sustainable crop production.

The project will use innovative modelling approaches to assess land suitability. Most work will concentrate on maize, mung bean and soybean, crops for which there is already some local experience in Cambodia, and good market prospects. The research team will produce outputs using GIS on areas suitable for these crops in the provinces of Kampong Cham, Takeo and Batdambang, taking into account soil, crop and socio-economic factors.

In WA the project will use a similar modelling approaches to determine the most suitable areas for pulse crops in the wheatbelt. Outputs from the project will help to re-establish industry confidence in the pulse industry which is widely regarded as being important for sustainable cropping in southern Australia.

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## *Consider Nominating.....*

The Victorian Branch of ASSSI offers two recurring awards for students. A brief summary of the awards is given below. Nominations for these awards should be sent to the Victorian branch secretary, Alice Melland, Dept. Primary Industries, RMB 2460, Hazeldean Road, ELLINBANK Vic 3821 or [Alice.Melland@dpi.vic.gov.au](mailto:Alice.Melland@dpi.vic.gov.au). More information is available from the branch's website: <http://amorphous.agfor.unimelb.edu.au/asssi-vic/>

### **The Frank Gibbons Award**

This award commemorates the life and career of Frank Gibbons, who was a pedologist with the former Victorian Soil Conservation Authority. The award is made annually to a student attending a Victorian or Tasmanian tertiary institution for an essay of 2000–5000 words. The author of the best essay—judged on scientific merit, relevance to soil science and the effectiveness in communicating research to a scientific audience—will receive a certificate, two years' membership to ASSSI and \$250.

Essays should be nominated by the student's supervisor. Nominations close on 1 October each year.

### **Conference Assistance for Postgraduate Students**

Postgraduate students, who have been members of ASSSI (Victorian branch) for at least 12 months and who have not already received this grant, are eligible to apply for financial assistance to attend a local or international conference. Grants can be up to \$250 for local and \$1000 for international conferences.

Applications can be received at any time but awards will only be made on 1 March and 1 September each year.

*Cycling and residual effects of phosphorus in the rainfed lowland rice ecosystem of Cambodia*

Sandy textured, low fertility soils which experience intermittent loss of soil-water saturation, are typical of the rainfed lowland rice ecosystems. Low P supply in the rainfed lowlands is one of the key constraints to rice yield, but little is known about the key processes of P cycling in these rice ecosystems. The objectives of the study were: 1) to determine the long-term P sorption-desorption behaviour in aerobic conditions, and P release characteristics of three main lowland rice-growing soils of Cambodia under alternating reduced and oxidised conditions; 2) to quantify the fate of fertiliser and residual P in the soil, and mass balances of P for rice in a acid sandy lowland soil; 3) to determine the potential for increased P uptake efficiencies by quantifying the turnover process of residual P and crop residues during the fallow period in rainfed lowland conditions; and 4) to develop a conceptual model of P cycling in lowland soils in which rice is grown under rainfed ecosystems.

To achieve these aims, a series of experiments in the field, glasshouse, and laboratory were undertaken on the major lowland rice soil of Cambodia: Prateah Lang, a strongly acid Plinthustalf with low to medium productivity potential (White et al., 1997a,b; Soil Survey Staff, 1994). Koktrap and Toul Samrong soils were also used to determine variation in P sorption and release on the major lowland rice soils of Cambodia. Like Prateah Lang, the Koktrap soil (Plinthaquult) was moderately to strongly acidic and had low to medium productivity potential but it had a higher clay content. Toul Samrong soil (Endoaqualf) was clayey, near neutral in pH and has high productivity potential for lowland rice.

The long-term P release characteristics of the three soil groups were examined. Largest increases in shoot and root DM, P concentrations and total P uptake of rice were obtained on the sandy Prateah Lang soil compared to the clayey Toul Samrong and Koktrap soils. This was attributed to increased available P in the resin extractable P fraction because of the reduced P sorption capacity of the sandy Prateah Lang soil. Conversely a higher residual P value was obtained on the clayey Koktrap and Toul Samrong soils than the sandy Prateah Lang soil, since the high P sorption on clayey soils allowed prolonged release of P into the soil solution.

The present results suggested that P fertiliser application on the sandy Prateah Lang soil had significant residual value. The initial use of 17 kg P/ha, followed by 8-10 kg P/ha per crop was adequate to maintain grain yields of 2.5 to 3.0 t/ha, a positive P balance in the soil, and a satisfactory available soil P level for rice crops. Application rates of P fertiliser higher than the recommended levels resulted in: 1) low relative P recoveries in plant uptake; 2) losses through leaching in a sandy soil when the ground water-table dropped below the soil surface; and 3) increased residual P associated with recalcitrant organic P and/or occluded P that is unavailable for crop uptake.

In the unfertilised soils, the amount of P extracted by resin was equivalent to less than 0.3 kg P/ha, and when sampled in air dried samples at harvest was little influenced by fertiliser P application. Most of the added P fertiliser was retained in soil as residual P in the NaOH-Pi, NaOH-Po, and Residual-P pools. However, it was shown the shoot DM, grain yield, and P uptake of rice were highly correlated with the resin-extractable P pool in the soil, suggesting that the resin extracted P represents a good predictor of the plant P uptake.

Soil inorganic P (Resin-P and NaOH-Pi) fractions were dominant among other P fractions when soil was collected from continuously flooded conditions, and analysed fresh. By contrast, labile NaOH-Po and occluded Residual-P were major soil P fractions analysed in air dry soils even though they were sampled from moist conditions. Fluctuations in most soil P fractions in the field, particularly of Resin-P and NaOH-Pi fractions over time, could be attributed to variations with dry, moist and saturated soil conditions in the field. This suggests the soil P pools were very dynamic and responsive to changing of soil-water regimes.

The residual value of the high-P (e.g. 16.5 and 33 kg P/ha) soil, treated additionally with straw incorporation, significantly increased biomass of volunteer pastures (legume: L and non-legume: NL) during the fallow after the wet season rice, particularly between the late dry season and early wet season. Indeed, the total biomass production and P uptake were significantly greater for NL compared to L fallow crops at all levels of residual P. This suggests that the non-legumes contribute much more to P turnover during the fallow period.

The application of crop residues either as rice straw or volunteer early wet season pastures marginally increased crop productivity and total P uptake, soil P reserves, and microbial biomass P, C, and N. However, more striking increases of these parameters were obtained with the combination of crop residues with inorganic P fertiliser. Microbial biomass P increased rapidly and reached maximum at two and four weeks after straw or fallow crop residue incorporation for the field and glasshouse conditions, respectively. The greatest increase in microbial biomass P at these early growth stages suggests that uptake of inorganic P by microbial cells can be extremely rapid. However, soil microbial biomass P declined mostly in active growth stages of rice (maximum tillering and/or flowering). This rapid turnover of microbial biomass and that its pool of sequestered P was released to the soil for P uptake by rice.

Soil labile organic P (NaOH-Po) extractable fraction and microbial biomass C both significantly increased over time in the field, and reached maximum at 40 weeks after rice straw incorporation, and their values were well correlated ( $r^2 = 0.78$ ). This suggests that the increase in the NaOH-Po fraction was closely related with extractable microbial biomass activity and its response to the additions of rice straw plus P fertiliser.

In conclusion, the rainfed lowlands are a complex environment for managing soil fertility because of the fluctuations in soil-water regimes, and these cause soil-water interactions with nutrients, especially with P, a major nutrient limiting rice yields. More information is needed to manage the effects of fluctuating soil-water conditions on P supply in order to increase productivity of rice over the range of soil groups including the soils reported in the thesis. This thesis has made a significant contribution to the understanding of P management and cycling in the rainfed lowland rice ecosystems of Cambodia, which would provide a basis for increasing output of rice production from the low P soils in Cambodia.

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# *CPSS Update*

## *Linda Bennison*

Congratulations to the following Certified Professional Soil Scientists who have achieved accreditation in 2003. The Accreditation Board has approved the following list of CPSS members who have completed a minimum of 50 hours of ongoing professional development as part of the CPSS accreditation scheme.

### **STAGE 3 CPSS achieving 2003 accreditation 4 June 2003**

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Mr. Peter Zund LAUNCESTON, TAS

#### **PLEASE NOTE...**

The next round of OPD diary assessments will occur in September 2003. CPSS members are reminded to forward their OPD diaries prior to September for assessment by the Accreditation Board.

All members of the Australian Society of Soil Science Inc are welcome to join the CPSS scheme. The professional soil scientist, Stage 1, is the entry level to the scheme however scientists with experience can apply to the Accreditation Board for either Stage 2 or Stage 3 CPSS classification. If you would like a 2003 Accreditation Handbook and Guidelines please contact the ASSSI office.

Linda Bennison  
Executive Officer, ASSSI

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## RAISING THE PROFILE OF SOIL

### Suggestions from the ASSSI national FutureSoils Conference in Perth, December 2002

*continued from Page 17*

114. Target gardeners to use less water in their gardens.
115. Complete an illustrated guide to Australian soil.
116. Communicate to allied professions in a non-defensive way about soil and landscape matters.
117. Brown Ribbon Day.
118. School students involved in soil learning activities.
119. Workshop and discussions on the importance of soil to Australian communities.
120. Soil cores from contrasting soils: eg sand, clay, duplex soil.
121. Pot plants growing in soil low and high in organic matter.
122. Demonstration of soil erosion in small plots.
123. Awareness program on fertiliser and pesticide use for home gardeners.
124. Awareness program for urban land users (developers and builders).
125. Primary and high school program on soils - provide resources for teachers and students.
126. Documentary series on 'soils' similar to 'water' series on SBS. Use global examples and relationships to world politics.
127. Television advertisements to raise awareness of the value of soil.
128. 'Soil watch' similar to 'water watch'.
129. Farmer workshops.
130. Extend soil information workshops to politicians - local councils, state and federal government.
131. The 'soil' knowledge training to be offered to rural merchandising agents in country towns.
132. Articles in local/regional/cities and national newspapers on soil research and issues.
133. School level education
  - soil activity day
  - small research projects
134. Soil pit field days.
135. Urban soil awareness: local councils to support activities "Know your garden soil".
136. Website with soil research described with easy understandable outcomes.
137. Understanding the economic BENEFITS of soil management in Australia.
138. Globally to assess the impact on poverty using global models.
139. Survey of soil management practices in Australia to be conducted by ABARE as part of its annual farm survey allowing cross-tab to be made between soil management practices and farm performance (financial and other).
140. Participate/compose/run "Simple Soils" with worksheets and activities at the school and farm level. Who will pay for this? Should we educate school teachers to spread the word to students- to spread the word to their parents. Keep trying to get funding for research into what are useful soil quality indicators for agriculturally productive land. Publish research, promote at conferences etc.
141. Mapping, analysis - chemical, physical and biological, trial sites.
142. SHORT TERM: increased use of basic statistics underlying the importance of soils. Increased use of media. Increased integration of soils with other information e.g. civil infrastructure. LONG TERM: increased education in schools and universities.  
*If IP becomes a problem then the society has failed.*
143. Website to be accessed by schools - emphasis on value of soils and what they are used for - include economic impact of soils.
144. Newspaper features/stories on soils in the Australian community. Lots of photos, include Sunday papers. Show use of soils and degradation of soils.
145. Progressive learning workshops.
146. Study the cropping and management history of paddocks on similar soils and climatic zones.
147. Work with university to develop 'best practice' model for sustainable agriculture in broad acre farming. Establish economic probability benchmarks for the model. Establish research program across a range of sites.
148. At field days and agricultural fairs, have stalls with promotional information with hands-on items and competitions with prizes mainly aimed at younger Australians.
149. Television or media programs aimed at reaching more people.
150. Highlight importance of soil as a resource and not an inexhaustible element.
151. Develop simple leaflets, newsletters and brochures for distribution to stakeholders.
152. Regular radio interviews, talk-back and news presentations.
153. Government legislation to draw attention to misuse of soil.
154. Wall of soil posters with problems/benefits outlined.
155. Round Robin of soil activities - 10 minutes each, simple tests. One message at each.



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# *CONFERENCES*

**Send information about upcoming conferences, courses, seminars or workshops to be advertised here**

2003 July	International Soil Tillage Research Organization, Queensland Tel (07) 5460 1354 Fax (07) 5460 1367 Email j.tullberg@mailbox.uq.edu.au
2003 October 3	Soil Surveying Symposium Current Practices and Future Directions Department of Primary Industries, Tatura, Victoria Contact: David Burrow or Aravind Surapaneni (03) 5833 5222 David.Burrow@dpi.vic.gov.au Aravind.Surapaneni@dpi.vic.gov.au
2004 February 3-28,	International Conference on Sustainable Management of Sodic Lands, Lucknow, India. Contact Dr DV Yadav. Email dvylucknow@rediffmail.com
2004 September 26-October 1	ISCO International Conference. Brisbane <a href="http://www.isco2004.org">www.isco2004.org</a>
2004 December 5-10	ASSSI/NZSSS Supersoil Conference, University of Sydney <a href="http://www.icms.com.au/supersoil">www.icms.com.au/supersoil</a>
2006 July 9-15	18th World Congress of Soil Science, Philadelphia, USA <a href="http://www.18wcss.org">www.18wcss.org</a>
2010 July	World Congress of Soil Science, Brisbane

## *Public Liability Insurance*

Public Liability Insurance is available from March 31 2003 to members of the Australian Society of Soil Science Inc. Insurance is arranged by The Australian Society of Soil Science Inc through brokers Fitzpatrick and Co with Liberty International.

Members can apply for insurance at any time during the year.

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TOTAL	\$361.00	\$561.00	\$491.00	\$711.00

An excess of \$500 applies to each and every occurrence and you need to complete an application form indicating the number of FULL-TIME employees, the limit of public liability required and details of any claims you have made in the past five years. Application forms are available from the ASSSI office and payment will be requested with an invoice.

PROFESSIONAL INDEMNITY cover is offered on an individual basis only. If you are interested in pursuing professional indemnity you will need to contact David Finn at Fitzpatrick & Co. on telephone 03 8544 1600 or Freecall 1800 672 146.

# ASSSI CONTACTS

## FEDERAL COUNCIL

### President

Cameron Grant  
University of Adelaide  
PMB 1  
Glen Osmond SA 5064  
Tel (08) 8303 7404  
Fax (08) 8303 6511  
cameron.grant@adelaide.edu.au

### Vice President

Neal Menzies  
University of Queensland  
Tel (07) 3365 2059  
n.menzies@uq.edu.au

### Secretary

Annie McNeil  
Department of Agronomy and  
Farming Systems  
University of Adelaide  
Roseworthy Campus  
Tel (08) 8303 7879  
Fax (08) 8303 7979  
ann.mcneill@adelaide.edu.au

### Treasurer

Keith Lindbeck  
PO Box 144  
Bull Creek WA 6149  
Tel (08) 9332 0671  
Fax (08) 9332 0672  
lindbyka@ca.com.au

### Executive officer

Linda Bennison  
PO Box 525 Mornington  
Victoria 3931  
asssi@bigpond.net.au  
Tel (03) 5974 1758  
Fax (03) 5974 1141

### Profile Editor

Lyn Abbott  
UWA, Crawley, WA 6009  
Tel (08) 9380 2499  
Fax (08) 9380 1050  
organic@agric.uwa.edu.au

## ASSSI WEBMASTER

Derek Yates  
derek.yates@uts.edu.au

## WA President

Andrew Harley  
Environmental & Earth Sciences  
Pty Ltd  
PO Box 196  
Nedlands WA 6909  
Tel (08) 6389 0862  
Fax (08) 6389 0863  
eeswa@eesi.biz

## WA Treasurer

Mr Martin Wells  
Land Assessment Pty Ltd  
PO Box 117  
Subiaco WA 6008  
Tel (08) 9388 2427  
Fax (08) 9381 4727  
landass@iinet.net.au

## WA Newsletter Editor

Dr David Allen  
Chemistry Centre,  
125 Hay Street, East Perth 6004  
Tel (08) 9222 3031  
Fax (08) 9325 7767  
allen1@iinet.net.au

## SA President

Position Vacant

## SA Secretary

Mr Bernard Zarcinas  
CSIRO Land and Water  
PMB 1  
Glen Osmond SA 5064  
Tel (08) 8303 8429  
Fax (08) 8303 8565  
bernie.zarcinas@csiro.au

## SA Treasurer

Bernie Zarcinas  
CSIRO Land and Water  
PMB 2 Glen Osmond 5064  
Tel (08) 8303 8429  
Fax (08) 8303 8565  
Bernard.Zarcinas@csiro.au

## ACT

see contacts for NSW Branch

## VIC President

Dr Aravind Surapaneni  
DNRE, ISIA, Ferguson Rd  
Private Bag 1  
Tatura, VIC, 3616  
Tel (03) 5833 5223  
Fax (03) 5833 5299  
aravind.surapaneni@nre.vic.gov.au

## VIC Vice President

Dr Robert Edis  
The University of Melbourne  
ILFR85 Howard St  
North Melbourne VIC 3051  
Tel (03) 8344 7131  
Fax (03) 9328 1250  
Mobile 0419 334 573  
roberte@unimelb.edu.au

## VIC Secretary

Ms Alice Melland  
NRE Dairy research Institute  
RMB 2460, Hazeldean Rd  
Ellinbank VIC 3123  
Tel (03) 5624 2281  
alice.melland@nre.vic.gov.au

## VIC Treasurer

Ms Karen Smith  
24 Henham St  
Hawthorn VIC 3123  
Tel (03) 9250 6800  
Fax (03) 9250 6885  
ksmith@unimelb.edu.au

## NSW President

Mr Greg Chapman  
Dept Land and Water Conservation,  
PO Box 3720  
Parramatta, NSW 2124  
Tel (02) 4751 3700  
Fax (02) 9895 7985  
gchapman@dlwc.nsw.gov.au

## NSW Secretary

Dr Brian W Murphy  
NSW Department of Land & Water  
Conservation  
PO Box 445, Cowra.  
NSW, 2794  
Tel (02) 6342 1811  
Fax (02) 6342 4551  
bmurphy@dlwc.nsw.gov.au

## NSW Treasurer

Dr John Crichton  
NSW Agriculture  
Locked Bag 21 Orange, NSW 2800  
Tel (02) 6391 3140  
crichtj@agric.nsw.gov.au

## RIVERINA President

Mr John Thompson  
NSW Agriculture  
PO Box 736  
Deniliquin NSW 2710  
Tel (03) 5881 9906  
Fax (03) 5881 3719  
john.thompson@agric.nsw.gov.au

## RIV Secretary/Treasurer

Mr Lindsay Evans  
NSW Agriculture  
521 st Michael St  
Deniliquin NSW 2710  
Tel (03) 5881 9906  
Fax (03) 5881 3719  
lindsay.evans@agric.nsw.gov.au

## QLD President

Mr Mike Grundy  
Dept Natural Resources & Mines  
80 Meiers Rd  
Indooroopilly QLD 4068  
Tel (07) 3896 9395  
Mobile 0419 718 058  
Fax (07) 3896 9898  
Mike.Grundy@nrm.qld.gov.au

## QLD Vice President

Mr Andrew Biggs  
Dept Natural Resources  
PO Box 318  
Toowoomba Qld 4350  
Tel (07) 4688 1062  
Fax (07) 4688 1487  
andrew.biggs@nrm.qld.gov.au

## QLD Secretary

Dr Robin Bruce  
24 Cassandra St  
Chapel Hill Qld 4069  
Tel (07) 3378 6229  
Fax (07) 3878 1801  
brucer@uq.net.au

## QLD Treasurer

Mr Cameron Vacher  
Landloch PL  
PO Box 555  
Darling Heights QLD  
4350  
Tel (07) 4631 1393  
Mobile 0408 753 158  
Fax (07) 4631 1870  
vacher@usq.edu.au

## QLD Newsletter Editor

Philippa Tolmie  
Dept Natural Resources  
& Mines  
PO Box 318  
Toowoomba QLD 4350  
Tel. 07 46881429  
Fax: 07 46881193  
philippa.tolmie@  
nrm.qld.gov.au

## TASMANIA

Dr Philip Smethurst  
CSIRO Forestry & Forest  
Products, GPO Box 252-  
12, Hobart 7001  
Tel 03 6226 7953  
Fax 03 6226 7942  
Philip.Smethurst@csiro.au

## NEW ZEALAND - President

Alan Palmer  
Massey University  
Private Bag 11222  
Palmerston North NZ  
a.s.palmer@massey.ac.nz

## NZ Editor

Alastair Campbell  
Dept of Soil Science  
Lincoln University  
PO Box 84  
Canterbury NZ  
campbell@lincoln.ac.nz

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**... with Environmental & Earth Sciences Pty Ltd on all soil, groundwater and waste management issues**

**Environmental & Earth Sciences is committed to the professional development of the soil science industry. Activities to further this development have so far included:**

- ✓ employing and training 20 soil scientists since the formation of the company
- ✓ sponsorship of the ASSSI and its training programs
- ✓ supporting and running seminars and courses across Australia about contaminated land
- ✓ founder of the Centre of Contaminant Geology to further the research and development of applied soil science and hydrogeology
- ✓ research in soil and contaminant science including bioremediation, effluent re-use, heavy metal distribution and acid sulfate soil
- ✓ encouraging staff to produce research papers and facilitating their dissemination

**NEWS FLASH! We are now open in Brisbane at PO Box 114 Boodall Heights, QLD 4034  
Call Tracey Bauer on 61 7 3865 6666 Fax: 61 7 3865 6300, e-mail: eesqld.eesi.biz**

**Philip Mulvey and our team at Environmental & Earth Sciences have specialised in the 'brown' side of the environment since 1983.**

**If you are passionate about soil science ✓**

**have experience in contamination ✓**

**and would like to be a member of our dynamic team ✓**

**please contact us for your interview.**

**Environmental & Earth Sciences Pty Ltd**



*soil is the foundation of life*

**HEAD OFFICE**

**"The Coal Loader", Balls Head Drive, Waverton NSW 2060, Australia**

**Phone: 61 2 9922 1777 Fax: 61 2 9922 1010 e-mail: eesnsw@eesi.biz and eesi@zeta.org.au**

**Internet: <http://www.groundscience.com>**

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