

Profile



Newsletter of the Australian Society of Soil Science Inc Issue 154 Sept 2008

SOIL ART BY RICHARD MACEWAN



This extraordinary sculpture is naturally formed silcrete from Fontainebleau, France. It is part of a large piece of silcrete donated to the Smithsonian Museum of Natural History for its Dig It soils exhibit which opened in July. Richard MacEwan took this photo when he visited the exhibition just a few days after it opened. See the full sculpture on page 9.

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FROM ASSSI PRESIDENT STEPHEN CATTLE



Recently, I attended the inter-Congress council meeting of the International Union of Soil Sciences (IUSS) in Brisbane as the ASSSI representative. Apart from the actual world Congresses, such inter-Congress meetings, which are held two years before the next Congress in the next host city, are the only occasions on which the full council of the IUSS meets. The council includes the bureau officers (president, vice-president, secretary-general, deputy secretary-general), financial officers (treasurer, budget and finance officer), the chairpersons of the four scientific Divisions of the IUSS, chairpersons of standing committees, the past president and past vice-president, a representative of each national member (eg ASSSI, NZSSS), and up to 15 honorary members.

Farewell and thank you to our ASSSI treasurer Alice Melland who has headed off to a research position in Ireland. Cameron Gourley has replaced her on Federal Council.

The inter-Congress meeting serves a number of purposes: general IUSS business is discussed and voted on, upcoming Congress hosts report on progress, the IUSS Divisions have an opportunity to meet and carry out business, and the upcoming Congress symposia are finalised by the Divisions. At Brisbane, approximately 40 people attended, including most of the bureau and finance officers, around 10 national member representatives, a range of Division and Commission office bearers and a sprinkling of honorary members and standing committee chairs. As part of the 5-day meeting, the Queensland Branch of ASSSI hosted a day long scientific symposium, including presentations on the activities of each of the IUSS Divisions. The Queenslanders also hosted a day-long field trip to show delegates a number of soil types and soil-related land management issues around Beerwah, Maleny and Maroochydore. Both of these events were well attended, and very well received. My congratulations go to the Queensland Branch.

Role of IUSS

I found the inter-Congress meeting to be an eye-opening and very useful meeting on a number of levels. To be frank, before the meeting I hadn't really given much thought to the operations of the IUSS above and beyond its organising a Congress every four years, and having various Divisions and Commissions. I came away from the meeting with a new appreciation of how the IUSS can be an important advocate for soil science on the world-wide stage, which is crowded with many other scientific bodies and unions. As an example of this, I discovered that the IUSS is a subscribing member of the International Council for Science (www.icsu.org/index.php), which includes around 28 other scientific unions, many of which are substantially large than the IUSS. The Secretary-General of the IUSS has been attending meetings of ICSU, and reported at Brisbane that our presence at ICSU may lead to important contacts and/or collaborations in the future. Now while the merits of the IUSS being involved with ICSU might seem pretty remote when you're bolusing in Bunbury, digging in Dalby, sampling in Ceduna or titrating in Tatura (my apologies to Lucky Starr), I think in this age of globalisation it's not a bad thing for our scientific discipline to have some sort of voice at a global scale. The notion that soil science may be lost as a stand-alone discipline should at least be postponed while we have representation at the highest level of scientific collegiality.

ASSSI and IUSS

In terms of how ASSSI fits into the IUSS as a national member body, we are currently relatively important because (i) we're hosting the next Congress, (ii) the president and vice-president are ASSSI members (although this is linked to hosting the Congress), (iii) we've a few members chairing Divisions and Commissions, and (iv) of the 56 national members, ASSSI is 6th in order of fees paid to the IUSS. Only the US (US\$55K), German (US\$11K), Japanese (US\$5.2K), UK (US\$4.0K) and South Korean (US\$3.3K) societies pay more in IUSS subscriptions than ASSSI (US\$3.0K), and of these, only the South Koreans pay their IUSS subscriptions directly from their own member contributions. In the other four cases, all the IUSS subscriptions are paid by National Academies. So, as it is with the Australian Olympic Committee, we can be proud of our position in the medal table, but we could be so much better 'if we had more funding'...

Despite my glibness, the prickly issue of the funding of the IUSS arose at the Brisbane meeting because the forecast budget for the next three years sees a drawing-down of IUSS cash reserves from US\$320K in 2008 to

US\$290 in 2010, as strategic initiatives are funded, and costs increase (including the weakening US dollar, in which all IUSS funds are held) the main source of funding support for the IUSS, other than possible surpluses from Congresses, is that of annual subscriptions from member societies, and the SSSA is warning that the US National Academy that pays IUSS subscriptions for the SSSA may scale back its (large) payment if the proportion of IUSS subscriptions made up by the American contribution does not come down significantly.

At present, the SSSA contribution makes up around 45% of the total subscriptions to the IUSS. In comparable scientific unions that the US National Academy also pays subscriptions to, the proportion of the total funds contributed by the US is more like 25-35%. The SSSA has asked the IUSS to explore ways in which the other national members can be encouraged to contribute more to the IUSS so that the US contribution is not diminished by their National Academy. In turn, the IUSS Executive has asked national members to consider increasing their contribution if at all possible. I won't go into the complexities of the current funding model, because there are different rates for countries in different economic groupings (eg Bangladesh pays less per member than Australia because it is a poorer nation) and I suspect there's been a degree of 'hiding' true member numbers from the IUSS by some societies, but basically I think ASSSI, as a relatively well-off national member, could afford to dig a bit deeper and set a good example.

As a start, the Federal Council has arbitrarily increased our 2008 subscription payment from US\$3055.00, requested by the IUSS based on our ordinary member numbers, to US\$4000 to reflect our student numbers too. While this is only a small gesture, I hope it will set a good example to other national members of the IUSS. In the future, the ASSSI Federal Council will be considering other sources of funding, such as from the Australian Academy of Science or other appropriate benefactor, to assist with the bolstering of our contribution to the IUSS. The way things are shaping up, a successful IUSS Congress in Brisbane in 2010 would represent a substantial windfall for ASSSI, so I think we can afford a little altruism now. So until next time, act locally, think globally.

In recent months two revered soil scientists have died - John Holmes and Tim Marshall. Their obituaries will appear in the December issue of Profile.

Stephen Cattle CPSS Stage 3

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 six branches (Qld, NSW, Riverina, Vic, SA and WA). Liability of members is limited.

ABN: 96 080 783 106

Website: www.asssi.asn.au

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

MEMBERSHIP

For all membership and CPSS application and renewal enquiries go to

<http://www.asssi.asn.au/members/memberships.htm> or contact the ASSSI executive officer Linda Bennison at office@asssi.asn.au, phone 03 5622 0804 or fax 03 5622 0806.

FEDERAL COUNCIL MINUTES

All minutes of ASSSI Federal Council meetings are available online to members at

<http://www.asssi.asn.au/MO/general/downloads.php>

PROFILE CONTRIBUTIONS

All contributions to Profile are welcome and can be sent to the editor at rebecca.lines-kelly@dpi.nsw.gov.au. Please email photos as separate attachments.

PROFILE DEADLINES 2008: 15 November.

PROFILE ADVERTISING

Advertising in Profile is welcome, and must be relevant to some aspect of soil science.

Rates are: \$220 full page, \$110 half page, and \$55 quarter page.

Information about conferences, courses, scholarships etc is published free.



NZ SOILS 2008 CONFERENCE

Early bird registrations for Soils 2008 close on 22 September. The organisers have finalised the program sessions, and a summary appears below. The social program includes a welcome function on Sunday, Hangi meal on Monday, train trip and dinner on Tuesday, barbecue on Wednesday, and conference dinner on Thursday. Full details about registration and the program are available at www.soilsconference.co.nz



Monday 1 December

Time	Venue 1	Venue 2	Venue 3	Venue 4
0915-1015	Plenary Lecture: DANIEL HILLEL			
1115-1215	Sustaining soil biological health and function	Techniques, new applications & informatics	Joint Commission meeting: 4.1 Soils and the environment 4.2 Soils and human health	
1315-1500	Soils and the carbon economy	Techniques, new applications & informatics	Joint Commission meeting: 4.1 Soils and the environment 4.2 Soils and human health	Sustaining soil biological health and function
1530-1715	Soils and the carbon economy	Techniques, new applications & informatics	Soils - landscape developments and dating Volcanic soils	Sustaining soil biological health and function

Tuesday 2 December

0830-1030	Valuing natural capital	Joint Commission meeting: 4.1 Soils and the environment 4.3 Soils and landuse change	Soils and the carbon economy	Techniques, new applications & informatics
1100-1215	Valuing natural capital	Joint Commission meeting: 4.1 Soils and the environment 4.3 Soils and landuse change	Soils and the carbon economy	Techniques, new applications & informatics
1315-1445	The water crisis	Joint Commission meeting: 4.1 Soils and the environment 4.3 Soils and landuse change	Valuing natural capital	Techniques, new applications & informatics

Wednesday 3 December Field trips

Thursday 4 December

0830-1030	Integrated environmental management: soil quality	Integrated environmental management: emissions/ runoff/ leaching & mitigation	Integrated environmental management: plant nutrition	The water crisis
1100-1215	Confronting salinity	Integrated environmental management: emissions/ runoff/ leaching & mitigation	Integrated environmental management: plant nutrition	Integrated environmental management: soil quality
1315-1500	Soil acidification	Integrated environmental management: emissions/ runoff/ leaching & mitigation	Confronting salinity	Integrated environmental management: soil quality
1530-1715	Soil acidification	Integrated environmental management: emissions/ runoff/ leaching & mitigation	Confronting salinity	Education: realising potential

Friday 5 December

0830-0930: Plenary lecture: Paul Reynolds, 0930-1015: Norman Taylor memorial lecture, 1045-1200: Horizons education forum: realising potential, 1200-1230: Awards & closing remarks



CPSS BOARD SEEKS NEW MEMBERS

The Certified Professional Soil Scientist Board comprises CPSS Stage 3 scientists. The Board provides peer review on the assessment of CPSSs and represents the interests of academia, consulting, research and industry. Membership is a two-year term with the opportunity to serve additional terms.

Expressions of interest are being sought from Leading Professional Soil Scientists (Stage 3 CPSS) to join the Accreditation Board. The Board meets on a quarterly basis via three teleconference and one in person meeting. Profiles of the current board members appear below.

Graham Price CPSS Stage 3 Chair CPSS Board

Graham had 32 years in the fertiliser industry and 10 years with two government departments. Following graduation from the University of Melbourne, he spent 8 years in cereal crop research with the Victorian Department of Agriculture in the Mallee and Wimmera before taking a position with a fertiliser company in Tamworth, conducting field crop nutritional research, helping to develop soil test interpretation data across several major soil types of the region. After 2 years with NSW Department of Agriculture in similar work, Graham took a position with a fertiliser company in Brisbane developing its soil, plant tissue and water testing service, compiling the interpretation data for many crops and soil types and then developing the protocol for interpreting the analytical data. He helped develop and conduct training courses to improve interpretation and recommendations given by advisers for fertiliser and soil amendment use by farmers. The last 4 years were spent with a small private company that provides similar services to the fertiliser industry in Australia. Professional activities include; currently, Chair CPSS Accreditation Board and member since 2003. ASSSI Federal President 1999 to 2000; Qld Branch President 1995 to 1996; member since 1974. AIAS Qld President 1982 to 1983; member since 1961; Fellow AIAST (awarded 1991). ASPAC Secretary 1995 to 1996; Member of Laboratory Proficiency Committee 2001 to 2004; foundation member 1990.

Stephen Cattle CPSS Stage 3

Stephen Cattle graduated from The University of Sydney with a BScAgr (Hons I) in 1991 and a PhD in Soil Science in 1995. In 1996 he was a Postdoctoral Fellow in the Department of Agricultural Chemistry & Soil Science, and in 1997 he accepted a lectureship in soil science in the Faculty of Agriculture. Stephen's research interests are centred on aeolian dust as a soil-forming factor in NSW, and on soil structural properties of shrink-swell clay soils (Vertosols) used for irrigated cotton production. His aeolian research has recently explored methods for detecting dust accessions to topsoils in semi-arid districts of NSW, the features of contemporary dust deposits and dust deposition rates in these areas. His ongoing work on the structural and other physical features of Vertosols has been supported by the Australian Cotton Cooperative Research Centre; he is specifically investigating issues such as the impact of saline and/or sodic irrigation water on the structural stability of Vertosols, and the soil resources available in the Lachlan valley, where the cotton industry is rapidly expanding. For both of these research interests, Stephen has focussed his fieldwork in the Namoi River valley of northern NSW, and the Lachlan River valley of south central NSW. He currently has collaborative research links at Griffith University (Brisbane) and Texas A&M University (USA). Between January 2002 and June 2003, Stephen was the Chair of the Teaching and Learning Committee, and the Associate Dean for Undergraduate Studies (BScAgr, BHortSc, BLWSc, BAnimSc degrees) for the Faculty of Agriculture, Food and Natural Resources. He has been the coordinator of Advanced Pedology and the unit coordinator of Soil Science 2 (SOIL2003) since 1997. Stephen has been a member of the Australian Soil Science Society Inc. (ASSSI) since 1991, and has served as the Newsletter Editor of the NSW Branch of the Society. In 1999, he co-organised a 5-day workshop in soil science under the auspices of the ASSSI (NSW Branch) and The University of Sydney. Proceedings of the workshop were published in 2001. In 1999, Stephen was the Treasurer for the International Union of Soil Science's Pedometrics Working Group symposium in Sydney, and in recent years he has presented papers at soil science conferences in Montpellier (France),



The current CPSS Board, from left: Stuart MacNish, Stephen Cattle, Graham Price, Larry white and Pam Hazelton. Cam Grant is absent.

Minneapolis (USA) and Christchurch (NZ). In 2001, he attended a 5-week course in micromorphology in Napoli (Italy).

Cam Grant CPSS Stage 3

I teach soil science at the University of Adelaide (introductory soil science at Roseworthy Campus, and senior level courses in soil & water conservation & management at the Waite Campus). I supervise Honours, Masters & PhD students, particularly international students interested in applied soil physics. My research focuses on soil water retention and plant-availability in swelling and non-swelling soils, as well as problems with soil structure in horticultural soils and the influence of soil properties on mobility of colloids in the environment.

I have been a member of the Australian Society of Soil Science Inc (ASSSI) since 1985 when I arrived in Australia, and I'm now accredited as a Certified Professional Soil Scientist at Stage 3. I was President of ASSSI 2002-2004 and I convened the 2006 ASSSI National Soils Conference held in Adelaide. I am a member of the International Soil Tillage Research Organisation (ISTRO) since 1988 and the International Union of Soil Science (IUSS) since 1986. I have been on the Editorial Board of Soil & Tillage Research since 2004.

Pam Hazelton CPSS Stage 3

I have over 35 years of experience in soil science, geomorphology and environmental management, gained from lecturing at 4 universities in Australia and 2 in Europe. I have been employed also a soil surveyor for the Conservation Service of NSW and the Department of Conservation and Land Management. At UTS and I am a member of the Industry Based Geotechnical Research Group and I lecture in soil science and geomorphology in environmental engineering which includes environmental assessment, management and planning. I am also a consultant for UTS engineering especially in land use change assessment. I believe that the expertise gained from studying and working in soils is not understood by many other professions and is very undervalued by them. The CPSS scheme is one of the avenues by which the expertise of a soil scientist can be promoted to the wider community in a professional manner.

Stuart Macnish CPSS Stage 3

Stuart has forty years experience in the application of soil and natural resource science in environmental impact assessment, environmental management planning, effluent irrigation planning and management, salinity assessment, land use management and planning throughout Australia and much of South-East Asia, as well as international and domestic training in natural resource assessment. He has specialist expertise in fluvial geomorphology and the integration of multi-disciplinary investigations in impact assessment for major infrastructure project investigations. He has led more than sixty impact assessments for major dam/weir, pipelines, powerlines, roads, irrigation developments and major infrastructure projects. Stuart also has a background in stakeholder and community consultation in rural and urban areas as well as with indigenous communities, both domestically and overseas. He is currently a member of the ASSSI Accreditation Board and actively supports the promotion of soil science as a fundamental discipline in understanding the impacts of man on the environment.

David McKenzie CPSS Stage 3

David worked for 18 years in soil structure research, mainly with NSW Agriculture. He then became a private consultant in 1996 and has been involved with the following projects: 1. Produced more than 100 soil assessment / management reports for landholders associated with winegrape, citrus, olive, nut, vegetable, cotton, wheat and dryland pasture production. The provision of key soil factor maps and variable-rate soil amelioration maps - based on a combination of soil pit inspections, yield mapping and appropriate remote sensing inputs - was a unique feature of these reports. 2. Principal Investigator on several extension initiatives including: Ute Guide: Healthy Soils for Sustainable Vegetable Farms (AUSVEG / Land & Water Australia) and SOILpak for Cotton Growers, Third Edition (NSW Agriculture). 3. Conducted soil management training courses in NSW, Qld and WA for over 450 farmers and advisers. 4. Carried out carbon sequestration studies under Oldman Saltbush. 5. Expert Witness in legal cases. Voluntary activities for the soil science community include: a. Member of the Board, CPSS accreditation scheme, ASSSI. b. Chairman of Working Group F (Visual soil examination and evaluation), International Soil and Tillage Research Organisation

Larry White CPSS Stage 3

Larry has some thirty five years experience in both the government and private sectors carrying out soil and land resource assessment, effluent irrigation, environmental management planning, soil sampling, policy preparation and training in south east Australia and the Northern Territory. He presently has his own consultancy based in

Central Victoria. His work attempts to identify the characteristics impacting on a proposed program and subsequently to develop a management approach that addresses the identified inherent key constraining soil profile and environmental characteristics. He has specialist expertise in Land Capability Assessment and has used this approach to be the principal investigator in over 250 land management proposals for individuals, developers, Councils and Water Authorities where programs of residential development, horticulture and agriculture were proposed. He has been involved in Policy review for the Victorian EPA in domestic wastewater and has prepared evidence and acted as Expert Witness at the Victorian Civil and Administrative Tribunal (VCAT). He is currently a member of the ASSSI Accreditation Board and strongly supports the promotion of soil science and soil conservation to understand the potential consequence of various development programs and the management that is necessary to move forward in a practicable sustainable manner. #

FROM THE ARCHIVE

To date Profile has featured extracts from the first and second issues of society's newsletter, **Soil News**, published in January and June 1957. The next issue in the archive is No 4, published in June 1958, featuring three papers on red brown earths by KH Northcote (morphology), JT Hutton (chemical properties), and TJ Marshall, EL Greacen and JW Holmes (physical properties). Below is a letter by JD Colwell, Wagga Wagga Agricultural Research Unit. You can read the entire newsletter at <http://www.asssi.asn.au/MO/downloads/profile/Soils%20News%20No%20004%20Jun%201958.pdf>

Your correspondent Mr FR Gibbons (December, 1957) raises what must surely one of the greatest problems facing Australia today, namely, the problem of developing this country with a much lamented shortage of scientists. The standard answer is, of course 'incentives for scientists'. This may be sufficient as a means for getting people into science but the simple incentive system of advancement according to scientific attainments, as operating in Australia today is far from satisfactory. The present incentive system is in fact directly responsible for the 3:1 bias of fundamental to applied work, suggested by Mr Gibbons - and the estimate seems conservative from a casual study of current scientific literature.

Mr Gibbons' reference to the North Coast of NSW, an area 'littered with broken farms', is an excellent example of this incentive system misfiring. For many years now, soil scientists, including myself, have worked on the soils of this region. We have studied the pedology of the soils and certain aspects of their chemistry with tolerable success. The results have served us all well, but unfortunately left the North Coast just as littered and broken as before. Despite the thousands of pounds spent advancing soil science in the region, the locals are still completely ignorant of the benefits forthcoming from this same science. It would seem that to experience the benefits of soil science one must be a soil scientist.

There are many similar examples. The reason for unproductive fundamental work of this kind is simply that under the present system the scientist is out for quick and easy results (ie basic fundamental studies!!) and dodges the knotty problems. I have even heard one scientist assert from his ivory tower that farmers don't know the sort of research work that should be carried out on their soils. We all know how much easier it is to retire into our scientific towers and study phosphate sorption, speculate on pedology, and so on, than to get out and find out 'why crops don't grow as they should'.

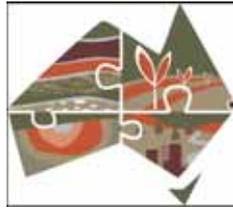
What then is the answer? Perhaps it is simply a matter of transferring the responsibility of doling out incentives from the scientific chiefs, to the benefiting public who at least have a vested interest. The success, or otherwise, of such a transfer may be seen soon in the wheat industry, where funds for research are being provided by the farmer himself in the form of State Wheat Industry Research Committees. Such a transfer of responsibility may well provide the incentive for scientists to do the work Australia really needs. #

FROM THE EDITOR: Thank you to everyone who contributed to this issue of Profile. Without you there would be no newsletter. I have now been editor for two years, and while I have really enjoyed the role, the December issue will be my last. If you are interested in taking on the editor's job please contact Linda Bennison at office@asssi.asn.au. In the meantime, happy reading! Rebecca Lines-Kelly

WORLD CONGRESS 2010 UPDATE

At the Queensland Branch AGM in July Mike Grundy reported on the organisation of the World Congress.

World Congress is now just two years away. The organising committee has successfully gained \$125,000 in funding from the



19th World Congress of Soil Science
Soil solutions for a changing world
BRISBANE AUSTRALIA 1 – 6 August 2010

Queensland Government and hopes to obtain comparable funding from the Federal Government. Sufficient sponsorship will help to reduce registration fees and ensure greater attendance especially by young soil scientists. Field tours are likely to be held in each state (except the Northern Territory) as well as in New Zealand. To promote the event, consideration is being given to holding a soil oriented art display at the Queensland Art Gallery, a commemorative postage stamp and production of a special vintage by a wine company. At the 1968 Congress in Australia the Atlas of Australian Soils was released, the first ever continental soils map. For the 2010 Congress, consideration is being given to the production of a new edition of the book *Soils and Landscapes of Australia*. A global map of world soils is also being considered.

IUSS inter-Congress meeting June 29 to July 4, 2008

More than 40 international and national IUSS delegates visited Brisbane for a range of meetings over six days. In addition to IUSS business, this event was used as an opportunity to promote Brisbane as the ideal venue for the 2010 World Congress. ASSSI members were invited to participate in two of the functions held during the week—a symposium on 1 July and a field trip on 2 July. The symposium was held at The University of Queensland, with presentations by nine invited speakers (including three Qld Branch members- Andrew Biggs, Philippa Tolmie and Clive Bell). A total of 110 people attended the symposium (42 IUSS delegates plus 68). The field trip (pictured right) consisted of four stops in the Sunshine Coast area at Beerwah, Maleny, Kawana Waters and the Glasshouse Mountains scenic lookout. Andrew Biggs and Ben Harms coordinated the field trip which was attended by 92 people (38 IUSS delegates plus 54). Arrangements for the meeting were coordinated by Kristie Watling. Feedback on both events was extremely positive. Copies of most of the symposium presentations, the field trip notes and some photos can be found in the Downloads section of the ASSSI website at <http://www.asssi.asn.au/general/downloads.php>.



Source: Queensland Branch newsletter August 2008

Keep track of World Congress developments at www.19wcss.org.au.

ARE YOU GIVING A SOILS PRESENTATION THIS YEAR?

If so, would you be able to include the Australian 19th World Congress of Soil Science slide at the end of your presentation? Download the PowerPoint slide

<http://asssi.asn.au/downloads/WCSSslide.pdf>

or contact ASSSI office to have it emailed to you.

DID YOU KNOW?

All World Soil Science Congress proceedings have been scanned and are available as PDF. About half of all proceedings are downloadable – each book is a PDF and the files are up to 500 Mb.

<http://www.iuss.org/pages/congress.htm>

'DIG IT' SOILS EXHIBITION



While in the US for the hydropedology conference in July, Richard MacEwan visited the Smithsonian Museum's newly opened soils exhibition and took these photos.

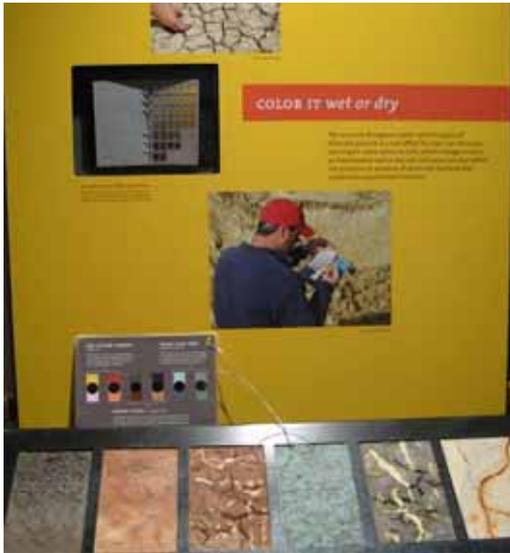
The Smithsonian Natural History Museum in Washington DC is currently hosting the 'Dig it – The secrets of soil', sponsored by the Soil Science Society of America. Static displays, videos, interactive demonstrations and exhibition volunteers combine to provide informative, comprehensive and accessible stories about soil and its importance to practically every aspect of our lives.

The exhibition opened on 19 July 2008 and will be on display at the Smithsonian for the next 18 months after which it will tour the states for 4 years through the Smithsonian Travelling Exhibition Service. The SSSA are seeking donations to fund the proposed tour.

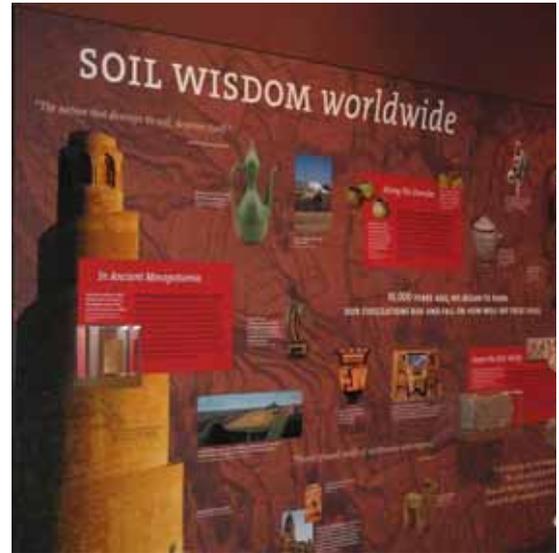
It is hard to convey the quantity and quality of 'Dig It' in a few words and I would recommend anyone visiting the USA to try and fit in a visit to see for themselves. From a pedological perspective, the array of 54 state soil monoliths (above) is an iconic component worthy of hours of pedo-contemplation (peditation?).

Right: Soils of the world and interactive quiz.





Entertainment value is high too: a movie in CSI mode forensically investigates the disappearance of a prize pumpkin, and two zany 'iron chefs' create different soils from the same ingredients plus 6000 years. The core of the content is clearly accessible to middle school



children and above and it has been the intent of the SSSA to address shortfalls in science education and to get some messages across concerning the importance of science as well as the importance of soil. Further information can be found at the SSSA and the Exhibition websites <https://www.soils.org/smithsonian/> and <http://forces.si.edu/soils/>. #

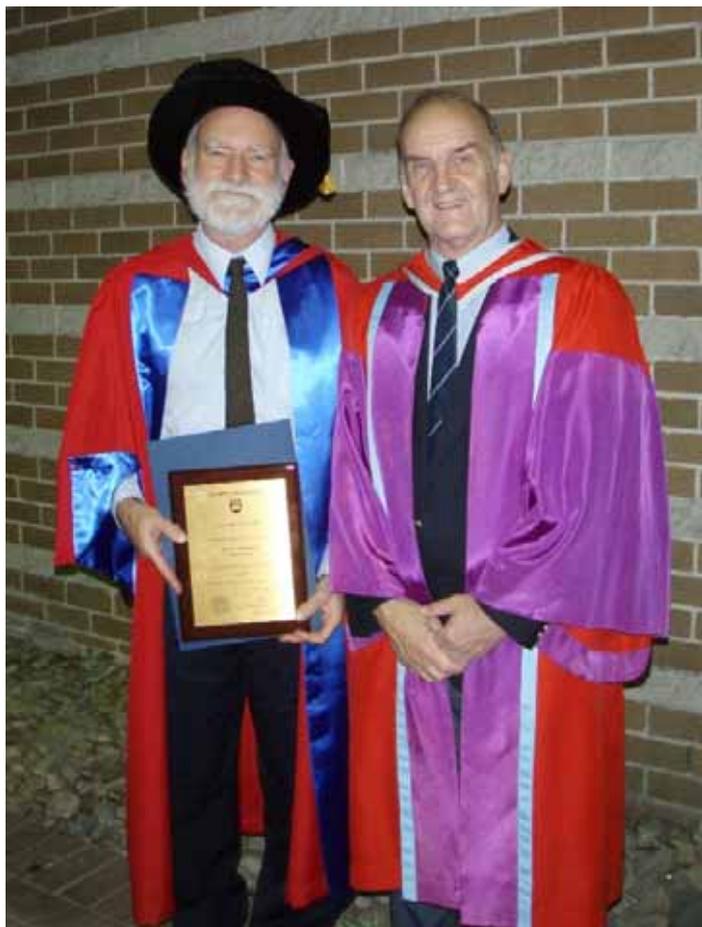


Above left: Soil colour station. Above right: Soil and culture display. Left: A cutaway model of the landscape with lots of messages about engineering, underground processes, waste disposal, gardening and water. The small boy is looking through a magnifying glass.



Right: These photos by Richard MacEwan show two aspects of the silcrete 'sculpture' donated to the Smithsonian 'Dig it' exhibition. Silcrete is formed when silica is dissolved in groundwater and resolidifies as a cement. It is a hard and resistant material, and though different in origin and nature, appears similar to quartzite.

HONORARY DOCTORATE FOR ROY LAWRIE



Roy Lawrie, left, with Professor John Morrison, head of Environmental Science and lecturer in soil science at the University of Wollongong.

ASSSI NSW Branch president Roy Lawrie was awarded an honorary Doctorate of Science at the University of Wollongong in July. Below is the citation delivered for his award.

Roy Lawrie has dedicated himself to the application of science for the public good. His contribution is more than a successful career; it stretches to a lifetime seeking to understand and protect the complex ecosystems of our continent. This is indeed a timely award to a scientist who made an outstanding contribution to our knowledge of the land.

Born in North Sydney in 1949, Roy Lawrie spent his school holidays on farms in rural NSW, thus beginning his understanding of the critical part the soil plays in the lives and livelihood of agricultural Australia. After graduating with a Bachelor of Science from Sydney University in 1971, he worked initially as an analytical chemist for the NSW Dept of Mines but soon moved to where his real interests lay, becoming a soil scientist with the NSW Dept of Primary Industries. Today he is the state's senior soil scientist.

Roy began his career testing soil fertility on the coasts and tablelands of NSW before mapping the soils of the Riverina and Tamworth. In the late 1970s, with soil surveyor Alec Riddler, he devised a five class system for assessing the suitability of soils for agriculture. It became the standard reference for soil

assessment.

Roy Lawrie has made an outstanding contribution to soil knowledge, policy and education in Australia. His advice has been sought by many government departments and councils on a vast range of soil issues ranging from soil fertility assessment and management to the impact of acid sulfate soils on waterways, and soil archaeology. He is Australia's leading expert on assessing the impact of European settlement on soils in the Sydney region.

Roy's work is regarded as critical in the development of rigorous agricultural and environmental management. Acknowledged by his peers as the national authority on soil surveys, he has a rare ability to read the landscape.

Roy Lawrie's publication record is extensive, varied and of high quality. He has also taken a leadership role with the Australian Society of Soil Science and an active part in the supervision of Australian postgraduate students, especially in the specialised field of advanced soil science techniques. His mentoring and supervision of honours and postgraduate students at this University has raised the quality and scope of their research. He has been an outstanding contributor and the students speak of him not just warmly but as a shining light.

Roy Lawrie is a modest man of outstanding intellect and achievement. His contribution is of critical importance today when the landscapes he sought to protect are increasingly threatened. Roy's methods are those of rigorous enquiry and deduction; his career exemplifies the scientific method at work. At the same time, Roy Lawrie is admired by his colleagues and students as a person of generous spirit with a great capacity for fellowship. He is a true contributor to that community of scholars which is at the heart of any university. Roy has enriched scholarship and research at this University and in this country, and he has greatly added to the collaborative spirit with which it is pursued. #



Dear ASSSI members,

Just a quick note from my current home, the UK, where I'm encountering the glee from the locals with GB leading Oz in the Olympic medal tally.

I left the sunny shores of Oz to be the on-site soil scientist for a project in NE England. The project involved bioremediation of tarry material (ie TPH, PAH and phenols) through controlling the soil environment. The input material was estuarine silt with a few unfavourable properties - sodicity, hard setting and low hydraulic conductivity. So basically the project involved daily monitoring of the stockpiles then we incorporated additives and ameliorants with turning to improve the soil properties.

I've found the project particularly interesting as it involves applying soil science principles on a large scale (treated 50,000 m³). Instead of weighing in grams we weigh in kilograms or tonnes then instead of a mixing with a spatula there was a front end loader, excavator or MUST!

I'm currently living in Glasgow, which is a lively city with the beautiful Highlands only a stone throw away.

Kind regards, Louise Cartwright
(ASSSI Member, CPSS Stage 2)



To: ASSSI Members
PO Box 1349
Warragul Vic 3820
AUSTRALIA



TASMANIA ESTABLISHES ASSSI BRANCH

Lucy Birkett reports on the establishment of the first Tasmanian Branch of ASSSI.

In June 2008, 15 committed 'soils' people met in the middle of Tasmania to inaugurate the first ever Tasmanian branch of ASSSI. Previously, ASSSI members located in Tasmania were nominally members of the Victorian branch. However, we felt that the time was right to establish our own branch as there is a growing number of people with an interest in soils in Tasmania, and the number of post graduate students enrolled in soils related projects is at an all time high. We feel that our Branch will provide an important forum for those interested in soil science and its role in the local environment, food production,

forestry, gardens and the economy. Richard Doyle, soil science lecturer at the University of Tasmania was elected president along with a committee from industry, government, agriculture and the forest sector.

The new branch has hit the ground running with lots of exciting activities planned such as a field trip in November including a spit roast and a look at some of the interesting soils around the south of the state, and a soil workshop planned for early next year, which will provide an update on soil research and other work being undertaken in Tasmania. There are also plans to run some industry training events on soils, for example; management of sodic soils, urban soils, erosion, tree decline and soil nutrient management. These activities will not only increase the opportunity for networking between existing members, but will also help to engage others outside the organisation, making them aware of our function as an organisation and hopefully attracting a few new members. Federal Council has kindly provided financial support to get us up and running, which will be invaluable in successfully establishing our new branch.

If you are interested in the new Tasmanian Branch please see the branch section on the ASSSI website at [check](#). #



Out in the field: from left Andrew Hammond, Richard Doyle and PhD student Jorge Martins.



Above: Sam Rees, left, and Richard Doyle at UTAS School of Ag Science Xmas 07 celebrations. You can see how seriously Tasmanians take soil science by the spades in their hands!

WHAT'S HAPPENING IN YOUR BRANCH?

Workshops, meetings, field trips, presentations, new members? Email news and photographs of your activities and photographs to the editor at rebecca.lines-kelly@dpi.nsw.gov.au.

NEW MEMBERS

Welcome to the following new ASSSI members.

NSW

Kenneth Bates
Irshad Bibi
Alisa Bryce
Jason Edwards
Murray Fraser
John Gallant
Matthew Gardner
Nathan Heath
Andrew Kinsella
Brendan Malone
Michael Nelson
Nabeel Niazi
Adrienne Ryan
Danda Sapkota
Adam Sullivan
Helen Wheeler

QLD

Denise Batten
Adam Breen
Tessa Chamberlain
John Corfield
Ashraf Khalifa
Walter
Mastenbroek
Tami Mills
James Payne
Timothy Rohde

SA

Girish Chappala
Sean Forrester
Gareth Lewis
Anitha
Kunhikrishnan
Narges Milani
Kavitha Ramadass
Paul Selvaraj
Balaji Seshadri
Beng UmaliA

TAS

Marcus Hardie
Stephen Ives
James Kirkham
Declan McDonald
Sven Nielsen
Samuel Rees
Samuel Walters

VIC

Darrel Brewin
Peter Clinnick
Graeme David
David Gouge
Ian M Wallace
Diana Whittington

WA

Frances Hoyle

PhD Scholarship opportunity in NZ Soil 15N as a potential indicator of land use intensity

To reverse trends of decreasing water quality caused by high nitrogen loads from pastoral agriculture, New Zealand needs direct and simple environmental indicators to support nitrogen (N) management on farms and within catchments.

A 3 year PhD fellowship is available within a programme funded to develop environmental indicators derived from isotope measurements to improve certainty in models used to manage nitrogen on farms and in river catchments.

The purpose of the PhD thesis will be to evaluate and develop the N isotope ratio ($^{15}\text{N}/^{14}\text{N}$) of soil as an indicator of the vulnerability of farm units to ongoing losses of N.

The basis for this work is the concept that management-related N losses, such as nitrate leaching and denitrification, discriminate against the heavy isotope, ^{15}N .

The PhD project will be based at the University of Waikato, and collaborate with scientists from the National Isotope Center (GNS Science), Lincoln University, and Environment Canada.

Applicants are expected to have a background in soil science/land management with an interest in farm production and/or environmental impacts.

The position will involve considerable field and laboratory work. Annual stipend is \$26K plus fees paid, tax free.

For further information or to apply, please email or send letter of application, contact details for 2 referees, and CV to Dr Louis Schipper, Schipper@waikato.ac.nz, Earth and Ocean Science, Private Bag 3105, University of Waikato, Hamilton, NZ.

Screening of candidates starts mid Oct 2008 until position filled.

For information on the Schipper research group see <http://sci.waikato.ac.nz/staff/erth/schipper>.

PUBLICATION AWARD FOR IAN



Left: ASSSI president Stephen Cattle presents Ian Oliver with the 2007 ASSSI Publication Award at the NSW Branch's recent meeting in Sydney. Ian won the award for his paper 'Stable isotope techniques for assessing labile Cu in soils: Development of an *L*-value procedure, its application, and reconciliation with *E* values'. The paper was co-authored with Yibing Ma, Enzo Lombi, Annette Nolan and Mike McLaughlin and published in the journal *Environmental Science and Technology* 40: 3342-3348 (2006). Ian did his research at CSIRO Land and Water's Centre for Environmental Contaminant Research in Adelaide.

HARALD JENSEN LECTURE 2008

CSIRO scientist Rob Fitzpatrick will give the 2008 Harald Jensen lecture on the topic 'The weight of the world on the shoulders of soil science: Amazing new linkages between soil, water quality, extreme drought conditions and criminal investigations'. The lecture is an annual event held by the NSW Branch of the Australian Society of Soil Science as a forum to discuss and reflect on contemporary and historical soil science issues. Dr Pat Walker delivered the inaugural lecture in 2005 on Australia's soil pioneers, followed by Neil McKenzie in 2006 on understanding soil processes and translating them to the landscape scale, and Bob Gilkes in 2007 on upscaling knowledge of soil materials at the nano level to assess and manage the soil and identify complex soil-forming processes. Rob Fitzpatrick will give his lecture on Friday 26 September in Sydney. For information on registration and booking go to <https://www.conferenceonline.com/index.cfm?page=booking&object=conference&id=12416&categorykey=&clear=1>.

VICTORIAN BRANCH NEWS

Twenty-three members and one non-member attended the Victorian Branch's biennial general meeting on 11 July. Outgoing president Bob White delivered his President's Report that covered activities during the past two years. The following office bearers were elected to form a new Committee for the next term: president, Mark Imhof; vice president, David Rees, treasurer, Nicole Mathers; secretary, Damien Adcock; committee members Kithsiri Dassanayake ('Dassa') and Jessie Horton, immediate past president: Robert White. New president Mark Imhof thanked the outgoing Committee and provided an overview presentation on Victorian soil health projects and an update on national land resource assessment activities. A copy of this presentation is available via the Vic Branch website at CHECK. Forthcoming events for the Victorian Branch include the Annual Professor GW Leeper Memorial Lecture to be presented by Dr Pichu Rengasamy, University of Adelaide, at the University of Melbourne on Friday 21 November. The Leeper Lecture Field Excursion will be held on the following day.

Below is a brief synopsis of Renga's presentation for the Leeper lecture.

Crop yield loss due to soil constraints in dryland agriculture in Australia equates to billions of dollars per year. Soil constraints such as sodicity, salinity, acidity, compaction, nutrient deficiency and toxicity can occur in both topsoil and subsoil layers. The occurrence of multiple constraints within the same soil profile is common in more than 60% of the agricultural land area in Australia. Australia-wide, the amount of unused water left in soil layers by rain-fed crops due to soil constraints is about 28,700 GL per annum, which is six times greater than the amount of water used by both domestic and industrial activities. While some soil management techniques have been successful in solving soil problems involving a single constraint, management strategies for solving multiple constraints have proven to be uneconomical. There is a gap in our knowledge in identifying the predominant, or common, factor when different issues cause constraints to plant growth. The current food crisis in many developing countries and the increased cost of food world-wide make it necessary to increase our ability to separate and correct the effects of these multiple factors through innovations in soil management and plant modification. #

Profile September 2008

LAND RESOURCE OFFICER

**Department of
Natural Resources & Water
Bundaberg / \$46 071 - \$67 647 p.a.**

We seek highly motivated, energetic and results-oriented people to work as part of our team driving sustainable natural resource management. The key duties of this position are:

- Understand, interpret and communicate soil and landscape information from existing land resource surveys to relevant clients and stakeholders.
- Undertake land resource surveys and crop suitability assessments.
- Describe, classify, and interpret soil, landform, geology and geomorphology features, particularly in relation to landscape processes.
- Provide knowledge, information and technical input to support Queensland government legislation, policies and plans.
- Utilise databases, spreadsheets, Geographic Information Systems (GIS) to capture, analyse and manage land resource data.
- Interact with other project, department staff and external clients ensuring a coordinated approach to natural resource assessment and research.
- Prepare and provide technical reports, papers, maps and information products to relevant clients and stakeholders.

You will possess a minimum of a degree qualification in soil science, agricultural science, land resource management, environmental science, applied science, natural resource science or agreed equivalent as determined by the Director General.

Closing date: Monday, 15 September 2008

REF: QLD/NRW7786/08

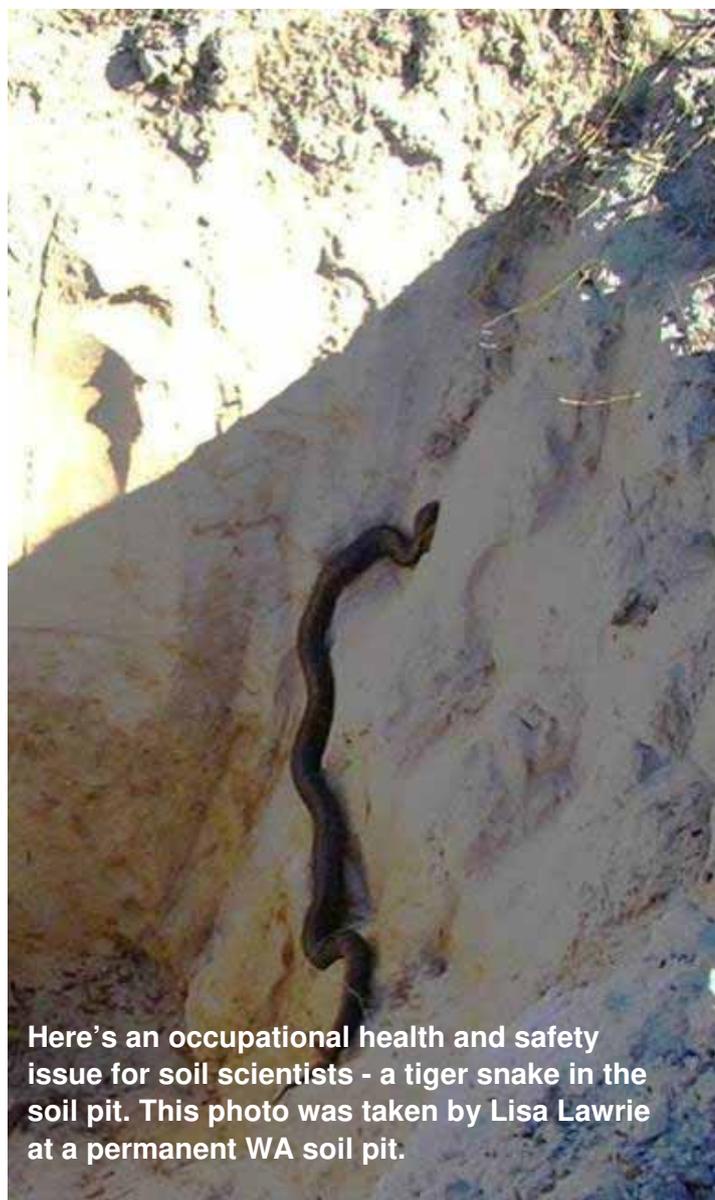
NEW STANDARD FOR ANALYSIS OF ACID SULFATE SOIL

After a long gestation, Australian Standard AS4969—2008: Analysis of acid sulfate soil was published in June this year. The Standard consists of 12 parts (with three more to follow shortly) and deals with both the preparation and analysis of acid sulfate soil. The Standard comes out of methods contained in the 2004 acid sulfate soils laboratory methods guidelines, based on research by ASSSI members Leigh Sullivan (NSW branch), and Col Ahern and Angus McElnea (Qld Branch). Other members of the Standards Australia Committee (EV-009-02-01) include chairman Glenn Barry, standards project officer Patricia Carreto, Steve Dobos (Dobos and Associates), Ian Wallace and Kirsty Outhred (NATA). ASSSI is represented on the parent committee (EV-009 Sampling and analysis of soil and biota) by Pam Hazelton.

There is potential now for these ASS standards to become International Standards. Members of the committee have been invited to attend the meeting of the International Standards Organisation (ISO) technical committee 190 on soil quality in The Netherlands this November, with the intention of making analysis of acid sulfate soil a new work item in Sub-committee 3 on chemical methods and soil characteristics.

The Standards can be purchased from the SAI Global website: <http://www.saiglobal.com/shop/script/search.asp>. For more information please contact Angus at: Angus.Mcelnea@nrw.qld.gov.au.

SOIL PIT OHS RISK



Here's an occupational health and safety issue for soil scientists - a tiger snake in the soil pit. This photo was taken by Lisa Lawrie at a permanent WA soil pit.



ACID SULFATE SOILS COURSE

Southern Cross University is offering a short course to equip professional officers with the knowledge and skills to develop and administer an acid sulfate soil plan of management in accordance with NSW legislative requirements.

The course consists of lectures, practical exercises and field excursions. It will be held at Lismore NSW on 11-13 November 2008.

Course leaders are Professor Leigh Sullivan, Scott Henderson and Crystal Maher. Cost is \$AU1500 (plus GST) which includes tuition, course notes, field excursions, refreshments and lunches. For more information contact the Centre for Acid Sulfate Soil Research at cassr@scu.edu.au

USE OF RECYCLED WATER IN SA HORTICULTURAL INDUSTRY



Seth Laurenson, a PhD student at University of SA, reports on the SA Branch's recent gathering to hear about use of recycled water in the horticultural industry, together with a case study of vineyard irrigation at McLarenVale.

Following on from the success of previous beer and pizza evenings, the ASSSI SA branch recently hosted another informal gathering of soil scientists at University of South Australia at the Mawson Lakes campus. Given the close proximity of the campus to the highly successful Virginia pipeline scheme, where around 10% of Adelaide's municipal wastewater is treated and distributed to a range of horticultural growers on the Northern Adelaide Plains, the theme for the evening was use of recycled water in the horticultural industry. Approximately 40 people came along to listen to talks by Jennifer McKay (UniSA), Jim Kelly (Arris) and Belinda Rawnsley (SARDI). The talks covered a broad range of topics ranging from grower's perceptions about using recycled water, managing nutrients and salts in soils irrigated with recycled water, and the effect of recycled water irrigation on soil microbial communities.

Community participation

Jennifer McKay began the evening by discussing the role of community participation and partnerships in developing successful and sustainable recycled water reuse schemes. Jennifer gave a rundown of the Virginia pipeline scheme, and then discussed the importance of community involvement when developing re-use schemes and the need to manage a range of interests held by various public agencies and the community at large. Based on an extensive survey that Jennifer and her students carried out among residents, growers and irrigators in the North Adelaide Plains region, the degree and importance of community participation in the management of water resources was highlighted. Grower communities in North Adelaide have united together to establish and formally manage the supply of recycled



water from the nearby Bolivar wastewater treatment plant. Due to the social concern of declining ocean water quality associated with direct discharge of wastewater, state government legislation currently favours land application of treated water. Social and financial issues have been addressed through contractual agreements between stakeholders such as South Australia Water, Virginia Irrigation Association and the Virginia Water Reticulation Services. Consequently the subsequent partnership encompasses all essential interest groups including State government, irrigators, growers and community.

Managing nutrients and salts

Following on from Jennifer, Jim Kelly presented some of the more detailed soil related aspects of the Virginia pipeline scheme. Jim discussed some key outcomes eventuating from soil fertility work Arris has carried out on the North Adelaide Plains over a number of years. The research conducted by Arris showed that using recycled water is no more problematic than using any other water resource, and some simple cost-effective tools and training can help growers better manage nutrients and salts in soils irrigated with recycled water. While nutrient loss appears to be minimal across the region, the accumulation of sodium is of concern. Jim highlighted the value of training

courses for growers in the region, provided by Arris and the Virginia Irrigation Association and the importance of communication between irrigators, state authorities and growers.

Microbial communities

Finally Belinda Rawnsley discussed research undertaken at another well known recycled water irrigation scheme to the south of Adelaide in the McLaren Vale, where recycled water is used to irrigate vineyards (see story below). Belinda discussed the susceptibility of vines to soil-borne fungal pathogens added with recycled water and the effect of recycled water on soil microbial communities. Although the incidence of root infecting fungi such as *Pythium* and *Fusarium* and *Cylindrocarpon* had an influence on root health, generally recycled water did not enhance potential root pathogens relative to other water source irrigation in the region. Belinda also discussed the inherently low microbial activity in these viticultural soils, and provided an indication of increased microbial activity with recycled water irrigation by increasing nutrient release and transfer to growing vines.

The evening was considered a success, with a strong focus on the application of soil science research to the needs of the horticultural industry and the outcomes this provides. If people would like further information about this event please contact Seth Laurenson at seth.laurenson@postgrads.unisa.edu.au.



RECYCLED WATER IRRIGATION IN MCLAREN VALE

A 62% reduction in the mains water allocation to growers in the McLaren Vale has highlighted a need to further utilise alternate water sources such as recycled water to ensure water security for irrigation. Given the close proximity of McLaren Vale to metropolitan Adelaide, where wastewater is generated, and the ongoing success of the current recycled water distribution scheme in the Willunga Basin, increasing recycled water irrigation in the McLaren Vale is likely to play a vital role in overcoming water shortages and rising mains water prices.

Most recycled water sources are generally rich in carbon, nutrients such as N, P and K, and salts. Ideally, recycled water should be utilised for its carbon and nutrient content without affecting crop production, crop quality or soil health. Given the inseparable nature of nutrients and salts in water, this calls for a level of management beyond that normally required for conventional water and nutrient sources. An understanding of how recycled water constituents distribute and interact in the soil around vines is an integral part of this management approach.

Soil survey

We are currently conducting a soil survey across a number of McLaren Vale vineyards, where either mains water or recycled water is being used for irrigation. We have collected soils from within the dripper zone, inter-dripper zone and the headland region near the head of vine row on each property and are analysing them for a range of chemical and biological properties, many of which include standard soil fertility testing parameters.

Due to the lower irrigation demands in viticulture relative to other cropping types, and the high degree of wastewater treatment achieved by the Christies Beach WWTP, annual loading of nutrients, salts and carbon under vines irrigated with recycled water is low relative to amounts already present in the soil (Table 1), and this invariably suggests minimal impact of recycled water on soil status.



Soil sampling within the dripper zone

Table 1. Selected soil properties measured in control soils and the estimated amount of recycled water constituents added in recycled water irrigation per year.

	Control soils§	Constituents added in recycled water# (per year)	#Calculated assuming the following: incorp. depth 20 cm, BD= 1.3 kg/m ³ , irrigation rate=1ML/ha, average recycled water concentration from Christies Beach WWTP.
C (%)	1.3 – 2.6	0.05	
Exchangeable cations			
K (mg kg ⁻¹)	195 – 1170	195	§Control soils include the combined values for all soils samples taken from the headland region regardless of irrigation type.
Ca	600 – 840	180	
Mg	36 – 312	132	
Na	23 – 276	1980	*Assumes all P applied in recycled water is in available (Olsen-P) form.
Olsen-P* (mg P kg ⁻¹)	10 – 60	90	

Sodium

While the sodium content of mains water can be high (80-160 mg L⁻¹), annual loading of sodium under recycled water is significantly higher (170-240 mg L⁻¹). Our survey results suggest that this increase in sodium is displacing more desirable basic cations, in particular calcium. A loss of calcium with a corresponding increase in sodium levels is likely to lead to a decline in the structural properties of the soil over a period of years, and this in turn reduces air and water movement around the root zone. Higher amounts of chloride, also present in recycled water, may also be inducing the movement of the displaced calcium in the soil profile. While calcium-rich amendments such as gypsum can restore or improve structure, quantifying the process of sodium build-up can provide a degree of precision to such applications.

Phosphorus

Generally, available phosphorus was considerably higher under recycled water irrigation relative to mains water irrigation. Given the high amount of phosphorus in recycled water and the available form it is typically found in, this increase in soil phosphorus is not surprising. Our findings suggest that in some cases, growers using recycled water may be able to reduce the amount of phosphorus fertilisers, such as DAP, applied annually or bi-annually, and in doing so reduce chemical fertiliser costs.

Cation exchange

We are currently planning further investigation into the cation exchange dynamics that have been highlighted in our survey. It is likely these investigations will focus primarily on the movement of calcium, nitrogen, chloride and sodium and the availability and distribution of phosphorus. It is our intention that this study will help growers gain the full benefit from recycled water and facilitate its integration into current water and nutrient management scheduling. If you have questions relating to this project, feel free to contact Seth (seth.laurensen@postgrads.unisa.edu.au). Thank you also to all the growers who are helping with this study.

SOIL BACTERIA DINE ON BTEX

Megh Mallavarapu of CRC CARE and the University of South Australia has identified native Australian soil bacteria which destroy the volatile organic compounds benzene, toluene, ethyl-benzene and xylene (BTEX) found in petroleum and oil spills. Bacteria which can tolerate BTEX have been identified in other parts of the world, but these are the first from Australia to show a specific preference for dining on these hazardous wastes. The microbes devour the carbon in the BTEX molecules, breaking the rest down into simple and harmless constituents of carbon dioxide and water: Megh and his team have isolated and sequenced the actual genes in the bacteria which degrade BTEX. Knowing what genes to look for will help in widening the search for more kinds of soil organisms that have a preference for dining on toxins, or identifying strains which do so even more efficiently. This will help expand the suite of organisms available to deal with pollution under different environmental and climate conditions, or with differing mixes of contaminants. For more information, contact Megha Mallavarapu on 08 8302 5044. #



IMPLICATIONS FOR FOOD AND SOIL IN A CHANGING CLIMATE

SA Branch vice president Melissa Fraser outlines SA Branch's next field trip in October.

One often meets the claim that soil science is 'a discipline of its own'. On the contrary it would be more rational to recognise that many sciences may meet in the study of soil, and that 'soil science' strictly interpreted would cover such a large area of knowledge as to be a term of little use. Certainly no man could make himself a master of it.

I recently found that quote in GW Leeper's fourth edition of Introduction to Soil Science (1964), a textbook written in the context that soil primarily is what plants grow in. Since that time we have seen a significant shift in the way that we study soil and how plants are grown. Leeper's observation however is still relevant, in that no single person could possibly master all of the highly variable facets of soil science.

At a recent national horticulture meeting, a representative of the hydroponics industry stated that 'there is no future in growing anything in the soil'. This statement was somewhat confronting and concerning to hear, not to mention wildly misleading. It did however induce reflection on my own knowledge and experience of soil science and the future of food production in this country.

With the significant price rises of fuel and fertiliser, the inevitable introduction of an emissions trading scheme and predictions of substantial changes in temperature and water availability in Australia, the cost of food production is certain to increase further and supply will surely be threatened.

To overcome such threats to food supply it is crucial that we as soil scientists recognise a future of vastly different food production. We must identify the research that is needed and work collaboratively across our disciplines to ensure Australia can continue to supply high quality, safe food at a price that is attainable for the consumer and profitable for the producer well into the future.

Running with this theme, the SA branch will host a field trip around Adelaide's food and wine growing regions on Thursday October 2, following the annual lecture by Prof Bob Gilkes on October 1.

First we will tour the northern Adelaide plains visiting vegetable growers to see how they are overcoming their soil and water issues and to identify potential areas for future research. We will also visit D'Vine Ripe, the 7ha glasshouse of hydroponic tomatoes to investigate the science behind growing in these systems and the place the soil scientist can potentially play within them. We will then venture to the Barossa Valley to see how the wine grape industry is reusing their waste water and the implications of doing so. More details to follow closer to the event. #

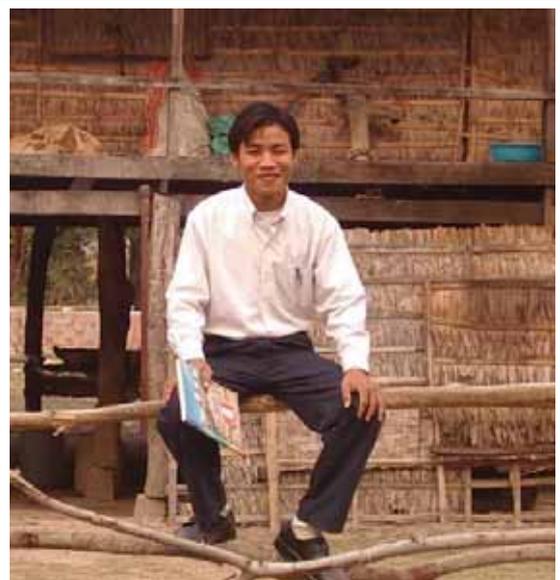
HELP SUPPORT SAVIN

ASSSI strongly supports student development in Australia with travel grants and bursaries. Recently, through the volunteer efforts of ASSSI Federal Treasurer Alice Melland, the executive were made aware of a student sponsorship project in Cambodia that was considered worthy of support.

Alice met Savin (pictured right) while teaching a soil science subject at his university in Cambodia in 2005, and was impressed by his exemplary academic record and dedication to developing his country through his studies. However, like many of the 75% of the Cambodian population who are under 25 years old, he has no means to financially support postgraduate study.

Alice is seeking donations for Savin to study a Master Degree in Cambodia. ASSSI has agreed to host a web donation facility. A donation from you will contribute to the \$US 2000 fees and \$US 5000 living expenses that Savin needs to study a 2 year Masters Degree in Rural and Economic Development in Cambodia. Please

consider making a donation of \$25 or more by following the instructions on the ASSSI website <http://www.asssi.asn.au/general/savin.php>. Your donation will make a significant difference to Savin's education and future job opportunities. Donations are not tax deductible. #



WOSSAC: WORLD SOIL SURVEY ARCHIVE AND CATALOGUE

Tony Proffitt, WA Branch, recently visited Cranfield University's World Soil Survey Archive and Catalogue (WOSSAC).

On a recent visit to the UK, I had the opportunity of visiting the building which stores all the soils information generated by the Soil Survey of England and Wales, as well as many other soil surveys, maps and reports produced overseas. This repository is currently being catalogued and moved from its home on the Silsoe Campus of Cranfield University (Bedfordshire), to the main campus. I wonder how many Australian soil scientists, land agencies and consultants who work overseas know about this resource?

Cranfield University houses the National Soils Research Institute (<http://www.cranfield.ac.uk/sas/nsri/index.jsp>). The WOSSAC project began in 2004 with the aim of developing an archive and catalogue of all substantial soil surveys, reports and maps made overseas in order to safeguard them and to make the information widely available to interested parties.



Soil surveys and assessments of land resources were integral parts of development planning and implementation up until about 1990. The WOSSAC project has become particularly important in recent times since there has been a renewed interest in soils on global and regional agendas and an increasing realisation of the crucial role of soils in sustainable development and the functioning of the environment.

Cranfield University has taken on the task of establishing a central collection of material with the support of the British Society of Soil Science (BSSS), the Tropical Agricultural Association (TAA) and the International Union of Soil Sciences (IUSS). Although initially concentrating on British materials, WOSSAC intends to link up with similar archives and work towards a virtual global archive of knowledge on soil resources. The archive currently contains over 20,000 hard copy reports and maps and a large collection of remote sensing imagery.

WOSSAC aims to establish an accessible archive of hard copies of endangered soil survey reports, maps and other relevant materials, and an interactive on-line catalogue of all surveys known, including those in archive at Cranfield and those remaining in company and private hands elsewhere. For more information, please visit www.wossac.com.

SH Hallett, P Bullock & I Baillie 2006. Towards a World Soil Survey Archive and Catalogue. *Soil Use & Management* 22, 227 – 228. #

WOSSAC SISTER WEBSITES

WOSSAC has two sister websites, the education site Soil-net.com and photographic image collection on Soils Worldwide.



Soil-net.com

Soil-Net offers extensive information, advice and activities about soils for students, teachers, parents and carers. Soil-net presents educational materials for ages 5-16) about current developments affecting soils-related policy making and soil science. 'As a topic, soil is increasingly making its way up the political agenda in the UK and in wider Europe but there is a lack of sound advice and reference on how soil affects our lives, for all age groups.' <http://www.soil-net.com/>



Soils Worldwide

Soils Worldwide gives access to the extensive soil photographic image catalogue, a unique collection of photographic imagery from around the world showing the true extent and variety of soil conditions, profiles and associated landscapes. SoilsWorldwide was part-funded by the British Society of Soil Science.

<http://www.soilsworldwide.net>.

1ST INTERNATIONAL CONFERENCE ON HYDROPEDELOGY

Richard MacEwan reports on the first international conference on hydro pedology, held in US in July.

Does a new name really mean a new approach? The editorial for a special issue of *Geoderma* began with the following question: Is pedology dying, thriving, or just changing? In our view, the emphasis of pedology is now shifting from classification and inventory to understanding and quantifying spatially and temporally variable processes upon which the water cycle and ecosystems depend.¹

Maybe the new name and associated discipline description simply serves to emphasise what was there all along. In my view pedology is not only about classification, inventory and mapping but should be very much concerned with interpretation of landscape processes and functional properties of soils. Any classification or mapping scheme that does not provide insight into these is nothing more than stamp collecting or expensive wallpaper production.

The first international conference on hydro pedology was held at Penn State University, 27-31 July 2008 and followed on from several significant previous events and publications over the last six years. A packed program served up 65 consecutive oral presentations and 45 posters for the 145 delegates from 19 countries. The organisation of the conference was excellent although networking and discussion time was limited due to the tight presentation schedule and the timing of the field tour which was left till the final day. Representation from Australia and New Zealand was small, but significant keynote papers were delivered by Alex McBratney and Brent Clothier. David Chittleborough helped to organise the conference but was unfortunately unable to attend.

The scope of the science was large, extending from global carbon and water balances to micro-scale moisture movement within peds. Student work was of high quality and presented well so the future science has freshly underpinned foundations supplemented with many new and emerging technologies. The final session exposed the many ideas that had been generated from the six presentation themes (big picture, emerging concepts, frontiers of modelling, advances in monitoring, integrated studies of the critical zone, and cutting edge applications). These ideas are worthy of a lot more debate but there will be more opportunity for the hydro pedology fraternity; the WCSS has a proposed symposium theme for hydro pedology in 2010.

The next international conference on hydro pedology will be held in Germany in 2012. Hans-Jörg Vogel will be convening the conference and can be contacted at hjvogel@ufz.de. Selected papers from the 1st conference may be produced for a special journal issue or other publication. A DVD of the powerpoint files and video record of the presentations is also promised. For further information and hydro pedology newsletters go the hydro pedology website at <http://hydro pedology.psu.edu/> #

¹ Opening lines of the editorial 'Revitalizing pedology through hydrology and connecting hydrology to pedology' *Geoderma* 131 (2006) 255–256 in *Hydro pedology: Bridging disciplines, scales and data*. *Geoderma* special issue. Edited by H. Lin, J. Bouma and Y. Pachepsky.



Hydro pedology conference delegates from down under: Alex McBratney (University of Sydney), Brent Clothier (Hortresearch, NZ), Erick Bestland (Flinders University) and Richard MacEwan (DPI, Victoria) with conference convenor, Henry Lin.

TRENDS IN SOIL SCIENCE EDUCATION

A recent survey of international trends in soil science education by Alfred Hartemink, Alex McBratney and Budiman Minasny has concluded that the soil science community should be worried by the declining numbers of soil science students. Extracts from the survey paper appear below. You can read the full paper in the May-June 2008 issue of the Journal of Soil and Water Conservation or at

http://www.redorbit.com/news/science/1367327/trends_in_soil_science_education_looking_beyond_the_number_of/

Australian courses

Survey responses were received from three universities in Australia and one in New Zealand. Soil science is taught in 16 universities in Australia. For our study, information on soil science courses and undergraduate, MS, and PhD theses was received from three universities (in Adelaide, Brisbane, and Sydney).

The University of Adelaide has trained soil scientists since the Waite Agricultural Institute opened in 1924. Since World War II, the university has produced on average at least one graduate in soil science per year at BS honors, MS, and PhD levels. The number of BS honors and PhD graduates has increased since 1995 to about 4 to 5 per year. The number of soil science theses for BS honors, MS, and PhD levels is presented in figure 10.

The number of students attending the 'Introductory soils' and 'Soil-plant relationships' courses more than halved between 2000 and 2006 at the University of Queensland. The trend is comparable to the data from the United States, but these are short-term data; longer term data have shown that interannual fluctuation is considerable.

At the University of Sydney, the second year course is an introductory one on soil properties and processes. The third year course is an applied course focusing on soil mapping, soil geography, and environmental issues. The fourth year consists of a large research project and three separate more advanced courses on soil chemistry, soil physics, and pedology. The number of BS students in second and third year soil science courses increased between the early 1990s and 2005. Student numbers in the fourth year are steady. The number of MS and PhD graduates has fluctuated considerably in the past two decades, but the number of PhD students is larger now than in the late 1980s and early 1990s.

In New Zealand, soil science is taught at six universities. At one university there was a general increase from the early 1980s to a peak in the mid-1990s, after which the numbers in the second and third years decreased to the level of the early 1980s. The large numbers in mid-1990s probably reflect baby boom echo-that is, an overall surge in young people heading to university. The soil science enrolment decline from early 2000s mirrors a decline in enrolment at the whole university.

In the United States and Canada, the number of soil science PhDs is decreasing relative to the number of MS graduates. In other parts of the world (e.g., the Netherlands and Australia), it is more or less the other way around: fewer students are graduating at the BS honors or MS levels, and the number of PhD graduates in soil science is increasing. In part this has to do with lower increased undergraduate education in the developing world, while students are more likely to go on for doctoral education in Europe and Australia.

Reasons for decline in soil science student numbers

If we assume that total number of students has not decreased, then the decline in soil science students is absolute. However, at some universities the decline in soil science student numbers may mirror the decline in overall enrolments. All in all, students seem to prefer other studies (business, law, and medicine), and these are generally viewed as moneymaking degrees. The decline is not unique to soil science but has also occurred in geology, geography, weed science, chemistry (Baveye et al. 2006), and several other disciplines such as physics. In 2003, less than 500 US citizens earned physics PhDs, the lowest number since the early 1960s (Nature, December 1, 2005). Overall, there is a strong growth in information science, medicine, and computer science and little student growth in engineering, mathematics, and physical sciences.

External factors include high school education systems, societal and university changes, and more internal factors such as links to agriculture, the relabelling of the discipline, and 'the failure to excite' factor. In many countries, soil science has maintained strong links with agriculture, while the interest in agriculture in the developed world has diminished. That has several causes, including there being enough food but also because there are far fewer farmers and many of them have higher degrees themselves (in the Netherlands, 20% of the farmers have a university or polytechnic degree). In other words, fewer academics are needed in agriculture- so they think.

Other problems start at high school. In the Netherlands, for example, the high school curriculum was rearranged 10 years ago into different profiles. These profiles (eg nature and technology, culture and society) contain six to eight fixed subjects and replace the classic model in which high school students chose their own set of subjects. Now it appears that with certain profiles it is not possible to study soil science. High school students with an interest in physical geography cannot take the profile that contains geography as that profile lacks the subjects necessary to be admitted to a soil science course at a university. A combination of essential science subjects with geography is not possible. So there is a mismatch between what high schools deliver and what universities require, at least for some university soil science courses. Another problem is that many geography teachers at high school are social geographers with little interest or encouragement in physical geography.

Research

In many countries, government funding for soil research has decreased since the 1980s (Hartemink 2002; Mermut and Eswaran 1997; Tinker 1985). In part, this was due to the economic policies of the Thatcher government in the United Kingdom, resulting in privatisation and the rule-of-market forces affecting many facets of society including the sciences (Tinker 1985). In part, it was due to the strong link between soil science and agriculture (Baveye et al. 2006). As the interest in agriculture was reduced in much of the developed world (there was ample food, agriculture was perceived to be harmful for the environment), so fell the interest in soil science. The decline in soil science was also due to its inability to cope with the new challenges. Some in the soil science community were split internally about the definition of the kandic or ferralic horizon, and there was a lack of answers for real-world problems or hard data useful for other disciplines. These trends have been observed in many countries, though with some exceptions (Bouma and Hartemink 2002).

Different departments have coped differently with rapid changes in society, and many have relabelled their activities to break away from agriculture or have merged with other departments into schools of natural resources or food production. It is hard to say what is fashionable, but the 'Department of Soil and Crop Sciences' is certainly not a popular name at the moment. All in all, it seems that soil is not a too favorable word in the naming of departments; in many cases, it has been replaced by land, earth, or environment. Despite the fact that there are far fewer active soil scientists than two decades ago and that there are fewer soil scientists trained in several parts of the world, the number of soil science publications still increases (Hartemink 2001). Between 1994 and 2006, the number of soil science publications in peer-reviewed journals doubled. No doubt there is some recycling of ideas and dilution of research results over several papers, but the quantity of soil-related publications is an indication that much soil research goes on and there are many global and local issues, now and in the future, to which soil science can contribute (Minasny et al. 2007).

The aging of soil science

Not only are soil science departmental names retiring, so are its people. The aging of the workforce is noticeable in many departments and soil research centers. Asked what he thought of the 18th World Congress of Soil Science, an Elsevier salesman responded, 'Lots of old people, perhaps not a sign of vigorousness' (Philadelphia, July 2006). The increasing age of soil science society members may be due to (1) the lack of influx from a younger generation, which would indicate a lack of soil science graduates, and/or (2) younger soil scientists not joining learned societies in the same proportions as the previous generation.

Conclusion

Funding, politics, and the vigorousness of a scientific discipline all affect student numbers. Choices differ greatly between individuals, universities, and nations, but some general principles apply: students are attracted by the vigorousness and chirpiness of a subject (some may call it sexiness) and the possibility of getting a position (perhaps even well paid) after a university degree has been obtained. While our research is specialising with advances in several subdisciplines, our teaching is generalising: more and more soil science is being taught as part of other science curricula (eg ecology). We also see that soil science is being taught by other departments and that soil research is conducted by other disciplines (eg geology). It is our impression that current soil science graduates have no problems finding employment, and there is a shift from the public to the private sector in job opportunities. But will these trends continue? What expertise is needed in the near and further future and does our soil science teaching yield capable graduates? The most difficult task ahead is not to convince policy makers and land users on the need for adequate and up-to-date soil information but to make sure that there are enough young soil scientists equipped with the latest techniques and insights to address future issues. Convincing students that soil science is a valuable study is an important part of that. #

FROM SODIC GULLY TO SPOON DRAIN



This erosion gully formed in a highly sodic soil west of Bundaberg, Queensland due to the concentration of run-off from a nearby road. Remedial works by the Queensland Department of Main Roads cost \$45,000 and have left no trace of the amazing sodic soil architecture. Photos: FrankSumner.



SEARCHING FOR THE HOLY GRAIL IN LUCERNE DEVELOPMENT

Richard Hayes reports on

Lucerne is a key pasture species for local grain and livestock enterprises with about half of all lucerne sold in Australia ending up in NSW. However, a major constraint to its broader adoption both within NSW and elsewhere is the prevalence of acidic soils which commonly reduces the yield of lucerne to only a fraction of its potential.

A collaborative research initiative between the Future Farm Industries CRC, GRDC and the state Departments of Primary Industries in NSW and Vic and SARDI in SA, has spent the last five years pursuing the goal of improving lucerne performance on acid soils. This is challenging research and in fact has been pursued previously in North America but thus far with little tangible outcome for lucerne growers.

Screening for aluminium tolerance

A recent breakthrough of the Australian research was the development of a solution screening system which enabled the screening of a large number of lucerne seedlings for their ability to regrow after the stress of high aluminium conditions. For the first time lucerne breeders now have the capacity to apply high selection pressure for performance under aluminium toxicity, an important aspect of acid soil conditions. Preliminary results suggest that lucerne seedling root growth has been increased by at least 15% due to the new selection technique.

Nodulation

The research team has now focussed its attention on the nodulation of lucerne. Nodulation is critical in maximising nitrogen fixation capacity of lucerne, an issue only likely to become more important with the increased cost of nitrogen fertiliser. Nodulation has also been shown to be an important aspect of lucerne survival as unnodulated plants appear to be less persistent than nodulated plants. Nodulation of conventional lucerne using the current commercial rhizobia has been shown to be very poor in acidic soils, with only about 20% of plants forming nodules.

Researchers are addressing the poor nodulation of lucerne in two ways: selecting lucerne plants on their capacity to form effective nodules, and screening of lucerne rhizobia that are more tolerant and effective in acidic conditions

A promising development in the current research has stemmed from a collection of naturalised lucerne rhizobia undertaken by Richard Hayes (NSW DPI) and Nigel Charman (SARDI) from across southern NSW in November 2007. The objective of the collection was to isolate lucerne rhizobia naturally adapted to acidic soil environments. Samples were taken from roadsides and paddocks containing established lucerne growing on acidic soils down to pH 4.2. In some cases the stands of lucerne were up to 15 years old and were from the Bookham, Bowning, Yass, Bredalbane, Goulburn, Crookwell, Ladysmith, Book Book and Tarcutta districts, on a range of soil types.

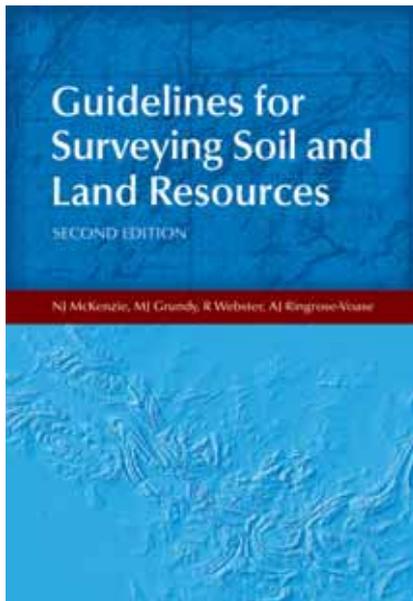
In total, 229 new strains of lucerne were collected and isolated. Screening of the new rhizobial strains is just about to begin but the diverse morphology of the material has already surprised researchers giving great hope that significant gains can be made in lucerne nodulation, particularly if elite rhizobia strains can be used in combination with 'acid-tolerant' lucerne plants. In view of the poor nodulation of the conventional lucerne rhizobia in acidic conditions, researchers are confident that there is much room for improvement in the performance of lucerne on acid soils which is an exciting prospect, particularly for growers in NSW.

For more information, contact Richard Hayes at 02 69381 615, richard.hayes@dpi.nsw.gov.au. #



Rhizobiologist Nigel Charman sampling for lucerne rhizobia on a roadside in the Goulburn district. The sampling was part of a more extensive field collection across southern NSW undertaken by researchers from NSW DPI and SARDI.

BOOK REVIEW: THE BLUE BOOK



Soil surveyor David Morand reviews the second edition of 'Guidelines for surveying soil and land resources', also known as the Blue Book.

The new Blue Book is scary. It has many pages that deal with the use of numbers, equations and computers. And it is because of this that I believe the book will be an invaluable reference for its target audience. Noting that '.....an antipathy towards quantitative procedures still prevails among resource scientists' (p 210), the Blue Book has been completely revised so as to overcome this attitude.

The need for these new guidelines has been generated by advances associated with computers since the early 1990s, including developments in geographic information systems (GIS) and databases, GPS, remote sensing and data analysis. Most, if not all, of the new material in the book covers these relatively new topics, but quantitative analysis has been given particular emphasis.

The book is divided into five parts: 1. Introduction, 2. Landscape context and remote sensing, 3. Survey mechanics, 4. Digital soil mapping and pedometrics and 5. Land evaluation.

Part 4 has seven chapters devoted to digital soil mapping and pedometrics. Several chapters in Part 2 are devoted to remote sensing, providing a good overview of the current state of this technology. As the title suggests, Part 2 also has very useful information on landscape processes. It includes sections dealing with geology map interpretation and regolith definition(s); from my observation, topics that are commonly misunderstood.

Part 3, Survey mechanics (survey resources, field operations, classification, etc), is based largely on the original Blue Book material with some additions. Of particular interest to me is a section dealing with validation and correlation of mapping. Also encouraging is the recommendation to use the World Reference Base (WRB) for soil classification whenever possible.

Two chapters are welcome inclusions. The first is Chapter 3 - Scale. Many users of resource information often overlook, or are unaware of the implications of scale. The second is Chapter 32 - Communication. From my experience this vital aspect of land resource survey is too often regarded as an afterthought (at least by us field people), something for someone else to do after the soil survey.

Acknowledged in the book is the need for decision makers to have information available now, rather than wait years for the results of monitoring programmes. The high, often prohibitive, costs of improvements to land resource survey are also recognised. Consequently Chapter 26 - Synthesis studies: making the most of existing studies - is an important inclusion.

A frustrating element of this book is the prohibitive cost of much of the new technology and techniques that it describes. Although the book makes many recommendations for best practice, the costs involved will possibly constrain their application. But this is not a fault of the book - it has comprehensively presented the most up-to-date information available for the topics it has addressed. As such, I think this is a very useful and informative book, a big improvement on its predecessor. And of course, the colour of the book cover is such that we can still call it the Blue Book.

Publication details

Guidelines for surveying soil and land resources (2nd edition, published April 2008)

Australian Soil and Land Survey Handbooks Series

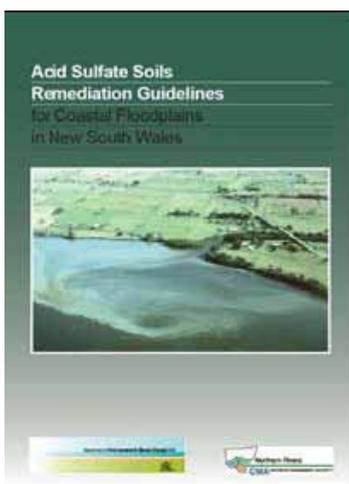
NJ McKenzie, MJ Grundy, AJ Ringrose-Voase, R Webster

CSIRO Publishing

Hardback 576 pages ISBN: 9780643090910 AU \$140.00

<http://www.publish.csiro.au/nid/22/pid/5650.htm>

NSW ACID SULFATE SOILS GUIDELINES



Broadacre ASS remediation strategies have evolved greatly in recent years, largely due to rapid developments in the understanding of scientific and technical issues. At the same time, the objectives of floodplain management have expanded to include a broad range of sometimes competing issues across the floodplain landscape, underlining the need for coordination of floodplain objectives and works across the floodplain landscape. The Guidelines have been prepared in order to meet that need. The Guidelines focus on those techniques that have proved to be practical and are already in common use:

- neutralisation and dilution by floodgate management/modification
- neutralisation and dilution by restoration of tidal flows to predominantly former estuarine areas
- wet acid containment (ponded pastures), and
- dry acid containment.

The Guidelines examine the science underlying the remediation strategies discussed, and place the requirements of each strategy in the context of the physical limitations of the landscape. Containment strategies are likely to be most effective in reducing environmental risk, and benefits of remediation are likely to be greatest in the lowest elevation floodplain sites, including the (former) freshwater backswamps and saline wetlands. The Guidelines are intended to be used by those who are involved in ASS remediation, including local council and government agency personnel, consultants, industry advisors, researchers and community organisations and will be available on the Department of Environment and Climate Change website at www.environment.nsw.gov.au. For further information contact Mitch Tulau from the NSW Department of Environment and Climate Change on (02) 6561 4978 or Mitch.Tulau@environment.nsw.gov.au.

Source: ASSAY newsletter August 2008
<http://www.dpi.nsw.gov.au/aboutus/news/newsletters/assay>.

Publication details

Tulau MJ (2007). **Acid sulfate soils remediation guidelines for coastal floodplains in New South Wales**. Department of Environment and Climate Change. DECC 2007/321. ISBN 978 1 7412 493 1

SOILS FOR WOMBATS

Andrew Biggs and Bruce Forster used their soils knowledge to help find new colony sites for the northern hairy nose wombats in central Queensland.

All northern hairy-nosed wombats live in Epping Forest National Park (Scientific) in inland central Queensland, which was gazetted in 1974. They occupy only 300 hectares of the 3160 hectares because most of the park's soils are heavy clays, which aren't suitable for burrows. Wombats like to burrow in deep, sandy soils along dry creek beds. They dig with their forepaws, throwing loose sand behind. They then walk backwards out of their burrow to bulldoze the sand clear.

There is now a strategy to establish more colonies because a natural event such as fire, drought, predators, disease or flooding could wipe out the Epping Forest colony. Over the next 15 years, it is envisaged four separate colonies will be established in suitable habitat across the wombat's historic Queensland range.

Bruce Forster and Andrew Biggs spent some time searching for a site for a second colony, using satellite imagery, soil, landform and regional ecosystem mapping, and site visits for vegetation and soil sampling. A suitable site, with the right soils, vegetation and landscape has been found near St George in southern Queensland, and will be fenced and prepared in readiness for the wombats' arrival next winter. Find out more at

http://www.epa.qld.gov.au/nature_conservation/wildlife/threatened_plants_and_animals/angered/northern_hairynosed_wombat_emlasior_hinus_krefftii/em/#gen7



SOIL SCIENCE PAPERS

Below are papers relevant to soil science published in the latest issues of Australian journals of Soil Research, Experimental Agriculture and Agricultural Research.

Australian Journal of Soil Research 46:4 2008

Prospects of improving efficiency of fertiliser nitrogen in Australian agriculture: a review of enhanced efficiency fertilisers

D Chen, H Suter, A Islam, R Edis, JR Freney, CN Walker

Salmonella uptake in sheep exposed to pastures after biosolids application to agricultural land

GJ Eamens, AM Waldron

The fate of phosphorus under contrasting border-check irrigation regimes

RW McDowell, D Rowley

Modeling time-dependent phosphate buffering capacity in different soils as affected by bicarbonate and silicate ions

N De, SC Datta

Soil N process inhibitors alter nitrogen leaching dynamics in a pumice soil

JC Menneer, S Ledgard, M Sprosen

Losses of nitrogen fertiliser under oil palm in Papua New Guinea: 1. Water balance, and nitrogen in soil solution and runoff

M Banabas, MA Turner, DR Scotter, PN Nelson

Losses of nitrogen fertiliser under oil palm in Papua New Guinea: 2. Nitrogen transformations and leaching, and a residence time model

M Banabas, DR Scotter, MA Turner

Comparing the effects of continuous and time-controlled grazing systems on soil characteristics in Southeast Queensland

G Sanjari, H Ghadiri, CAA Ciesiolka, B Yu

Land-use effects on soil properties on the north-western slopes of New South Wales: Implications for soil condition assessment

BR Wilson, I Growns, J Lemon

Evaluation of long-term soil management practices using key indicators and soil quality indices in a semi-arid tropical Alfisol

KL Sharma, JK Grace, UK Mandal, PN Gajbhiye, K Srinivas, GR Korwar, VH Bindu, V Ramesh, K Ramachandran, SK Yadav

Soil organic carbon stocks in saline and sodic landscapes

VNL Wong, BW Murphy, TB Koen, RSB Greene, RC Dalal

Changes in soil microbial biomass and community composition along vegetation zonation in a coastal sand dune

S Yoshitake, T Nakatsubo

Improved drainage and greater air-filled porosity of raised beds in south-western Victoria

JE Holland, RE White, R Edis

To access the abstracts go to [h](#)

<http://www.publish.csiro.au/nid/85/issue/4146.htm>

Australian Journal of Soil Research 46:5 2008

Genesis of soils across a late Quaternary volcanic landscape in the humid tropical island of Leyte, Philippines

IA Navarrete, K Tsutsuki, R Kondo, VB Asio

Effect of biosolids on the organic matter content and phosphorus chemical fractionation of heated volcanic Chilean soils

M Antilén, M Briceño, G Galindo, M Escudey

Plant-available nitrogen supply from granulated biosolids: implications for land application guidelines

SM Eldridge, KY Chan, ZH Xu, CR Chen, I Barchia

Using poultry litter biochars as soil amendments

KY Chan, L Van Zwieten, I Meszaros, A Downie, S Joseph

Base cation availability and leaching after nitrogen fertilisation of a eucalypt plantation

AD Mitchell, PJ Smethurst

Effects of different soil management practices on winter wheat yield and N losses on a dryland loess soil in China

K Jin, S De Neve, B Moeskops, J Lu, J Zhang, D Gabriels, D Cai, J Jin

Evaluation of sustainability of mixed food crop fields by monitoring particulate organic matter (POM) status and nutrient concentrations

L Koutika, M Yemefack, D Folefoc

Soil quality assessed by carbon management index in a subtropical Acrisol subjected to tillage systems and irrigation

FD De Bona, C Bayer, J Dieckow, H Bergamaschi

Pedotransfer functions for predicting the hydraulic properties of Indian soils

P Adhikary, D Chakraborty, N Kalra, CB Sachdev,

AK Patra, S Kumar, RK Tomar, P Chandna, D

Raghav, K Agrawal, M Sehgal

Relations between sorption behavior and electrokinetic remediation effect in soils contaminated with heavy metals

Z Shen, B Ju, X Chen, W Wang

To access the abstracts go to

<http://www.publish.csiro.au/nid/84/issue/4147.htm>

If you have had a soil science paper published recently in a national or international journal, send the details to the Profile editor at [rebecca.lines-](mailto:rebecca.lines-kelly@dpi.nsw.gov.au)

kelly@dpi.nsw.gov.au

AUSTRALIAN PEDOMETRICS PAPER IN FINAL FIVE

An Australian-authored paper by Viscarra Rossel, Taylor and McBratney is one of five nominations for the IUSS best paper in pedometrics 2007. The five papers are listed below, and the abstracts and PDFs are available at www.pedometrics.org/best_paper_2007.asp.

1. Kerry R & Oliver MA 2007. The analysis of ranked observations of soil structure using indicator geostatistics. *Geoderma*, 140, 397–416.
2. Lark RM 2007. Inference about soil variability from the structure of the best wavelet packet basis. *European Journal of Soil Science*, 58, 822–831.
3. Li W 2007. Transiograms for characterising spatial variability of soil classes. *Soil Science Society of America Journal*, 71, 881–893.
4. Viscarra Rossel RA, Taylor HJ & McBratney AB 2007. Multivariate calibration of hyperspectral γ -ray energy spectra for proximal soil sensing. *European Journal of Soil Science*, 58, 343–353.
5. Weller U, Zipprich M, Sommer M, Zu Castell W & Wehrhan M. 2007. Mapping clay content across boundaries at the landscape scale with electromagnetic induction. *Soil Science Society of America Journal*, 71, 1740–1747.

IUSS members can vote for the best paper by emailing b.minasny@usyd.edu.au with Best Paper 2007 in the subject line. List the papers by number in order of preference, with the paper you regard as the most worthy winner listed first. The vote will end on 30 November 2008. Certificates will be presented at Pedometrics 2009 in Beijing. #

SOIL NOTES

Mars soil analysis

Soil near the north pole of Mars is surprisingly Earthlike, with a pH not unlike many vegetable gardens. Topsoil has a pH between 8 and 9 and contains magnesium, sodium, potassium, and chloride. Shallow soil profile excavations are consistent with late stage downward migration of salts, implying the presence of small amounts of liquid water even in relatively recent Martian history. Read the paper 'On the in situ aqueous alteration of soils on Mars' by Amundson et al in *Geochimica et Cosmochimica Acta* Vol 72(15) 1 August 2008.

Harmonised world soil database

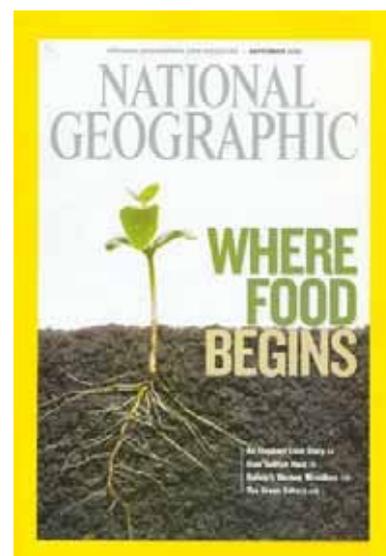
FAO and the International Institute for Applied Systems Analysis have combined regional and national updates of soil information with the information already contained within the 1:5,000,000 scale FAO-UNESCO digital soil map of the world, into a new comprehensive harmonised world soil database available online at <http://www.iiasa.ac.at/Research/LUC/luc07/External-World-soil-database/HTML/index.html?sb=1>

Online geological maps

The first digital geological map that spans the globe has been unveiled by a collaboration of Earth and computer scientists called OneGeology. The team, covering about 100 organisations in more than 70 nations, has integrated national and regional geological maps from across the world. <http://www.onegeology.org/>

National Geographic soils feature

The September issue of the National Geographic Magazine has a cover story on soils, 'Where food begins'. Both the article and pictures can be viewed online at <http://ngm.nationalgeographic.com/2008/09/soil/mann-text>



Soil profile animations

UK's Wycombe High School has created some animated illustrations to help students understand how different types of soil profiles are formed. <http://www.school-portal.co.uk/GroupRenderCustomPage.asp?GroupID=12426&ResourceId=96848>

SOIL QUERIES

ASSSI members are using the ASSSI website to search for soils information. Below are some recent questions. If you can help, please contact ASSSI executive officer Linda Bennison and she will put the answers on the ASSSI website.

Soil training

I would like to know if there are ASSSI activities/seminar/training programs which I can attend to continue to development my skills and knowledge in soil science. It appears that while many training programs are available which are designed for people to improve their vocation skills including management, accounting and finance, those related to soil science are limited. Your response to this enquiry would be appreciated.

Pocket sized soil samplers

I have had an enquiry for 'pocket sized soil samplers'. Can anyone give me a lead on where they can be purchased?

3. Standard soil samples

I'm emailing in the hope that you will be able to help us in locating, or at least direct us towards some standard soil samples varying in known organic carbon, clay content, texture and pH. I've been asked to do some analytical work for NICNAS purposes and have been unable to source the standard soil samples required for the test 'Determination of Soil Adsorption/Desorption, using a Batch Equilibrium Method' (OECD TG 106). Any help or direction would be much appreciated.

4. Low cost literature searches

I find it very difficult to obtain online access to any journal articles and other research information without having to pay US\$ 30 plus per article. Memberships for individuals (I am self-employed) that allows online access to libraries and, for example, Science Direct, is only available to institutions, students etc. I live 200km outside a capital city, so the only option for me is online access. Do you have any advice for me? I am really information-starved trying to do literature searches on the internet.

SOIL EVENTS

3rd international biochar initiative conference, Newcastle UK

September 7-11 2008 <http://www.biochar-international.org/>

6th international acid sulfate soil conference, China

September 16-20 2008 www.6assard.org

5th international conference on land degradation, Italy

September 18-22 2008 <http://www.iamb.it/5ICLD/>

Australian Society of Agronomy biennial conference, Adelaide

September 21-25 2008 www.agronomy.org.au/

ASSSI NSW Branch Harald Jensen lecture

26 September 2008

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

Digital soil mapping, USA

October 1-3 2008 <http://dsmusa.org>

International year of planet Earth joint meeting, USA

October 5-9 2008 <https://www.acsmeetings.org/>

Onsite and decentralised sewerage conference, Benalla

October 12-15 2008 <http://www.awa.asn.au>

Acid sulfate soils training course, Southern Cross University, Lismore

November 11-13 2008 cassr@scu.edu.au.

ASSSI Vic Branch Leeper lecture

November 21 <http://www.asssi.asn.au/MO/vic/vicactiv.php>

Interactions of soil minerals with organic components and microorganisms, Chile

November 24-29 2008

<http://forest.akadem.ru/Konf/2008/6/Info2.pdf>

Soil—the living skin of Planet Earth, NZ

December 1-5 2008

<http://conferences.massey.ac.nz/Soils2008/index.htm>

5th Australasian soilborne diseases symposium

February 5-9 2009 www.conlog.com.au/asds

Australian and New Zealand geomorphology group inc, Melbourne

July 7-12 2009 www.geomorphology2009.com

2nd international conference on biohydrology, Slovakia

September 21-24 2009 <http://www.ih.savba.sk/>

19th World Congress of soil science, Brisbane

August 1-6 2010 <http://www.19wcso.org.au>

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