17th Professor GW Leeper Memorial Lecture

The ASSSI Victorian Branch and University of Melbourne School of Land and Environment jointly hosted the 17th Professor GW Leeper Memorial Lecture on Friday 21st November 2008. The Lecture was attended by approximately 100 people, about half of these being ASSSI members.

Mr John Martin was the introductory speaker presenting on 'Leeper and Northcote'. John was a student of Leeper's and worked with Keith Northcote in SA and NT. Both Leeper and Northcote were identified for their substantial contribution to soil science. Leeper was known for his meticulous approach towards writing papers and the time and emphasis on laboratory and field work. Northcote (also a student of Leeper's) was known for his strong emphasis on field work and was recently included in the '2000 Outstanding Intellectuals of the 20th Century' for his 'outstanding contribution to soil science as a pedologist'.

John described some of the interactions between these two influential soil scientists. This included Leeper's controversial article 'What use is pedology?' (Soils and Fertilizer 1953) that suggested there was little practical use of pedology and Northcote's article in response (Soils and Fertilizer 1954) that refuted Leeper's paper, describing pedology as central to many other fields such as chemistry, physics and botany.

Dr Robert Edis, Acting Dean of the School of Land and Environment at Melbourne University, then introduced Dr Pichu Rengasamy ("Renga") as the guest speaker for the 17th annual Leeper Memorial Lecture. Renga, a Senior Research Fellow at the University of Adelaide, works in the areas of salinity, sodicity, water use by crops and subsoil constraints. Renga was awarded the J.A Prescott Medal of Soil Science in 2007 for his work in these areas.

During the lecture Renga identified that crop yield loss in dryland agriculture in Australia amounts to billions of dollars per year due to soil constraints such as sodicity, salinity, acidity, compaction, nutrient deficiency and toxicity that occur in both surface soil and subsoil horizons. Furthermore, multiple constraints occurring in the same soil profile are common in more than 60% of the agricultural land area in Australia.

Renga noted that sodicity can adversely affect the structure of soil and that gypsum has been used to improve soil structure in some soils but not others. Renga and his research team explored this and found that gypsum had a positive or negative impact on soil structure depending on the electrical conductivity of the soil. Thus, the impact of sodicity and the effect of gypsum on soil structure are dependent on the salt content of the soil.

Renga has also been involved in research investigating salt accumulation in soil horizons with low permeability and thus reduced leaching. The accumulation of salt in sodic soils is different to the mechanisms that cause low permeability in the upper layers (i.e. < 2 m) in soils affected by dryland salinity. In sodic soils, salt accumulation occurs at depth (i.e. 10 – 15 m) and therefore only affects plants when rainfall or irrigation increases the height of the water held in the low permeability layer of the soil.

Part of this research explored ways to control the impact of soil constraints such as salinity and sodicity on production. This included the use of plants that exclude sodium when taking up water and/or are boron or salt tolerant. The use of plants that take up water at a lower osmotic potential was also identified as being useful Australia-wide, as the amount of water left in soil

layers unused by rain-fed crops due to soil constraints is about 28,700 GL per annum – six times more than all water used domestically and industrially.

The mechanisms responsible for the adverse impact of pH on plants were also investigated. The solubility and speciation of aluminium at different soil pH levels and the presence of calcium carbonate were identified as important mechanisms. The use of plants (i.e. lucerne, vetch, faba beans, field peas, lentils) that decrease the pH of soils was also investigated. The pH change occurred mostly in the rhizosphere but also, to a lesser extent, in the soil. Thus, these plants were identified as being possible strategies for reducing soil constraints.

In conclusion it was stated that "to improve agricultural production, it is necessary to increase our ability to separate and correct the effects of these multiple constraints through innovation in soil management and plant modification". Renga suggested that, as soil scientists, we need to work together to achieve this goal. This includes bringing people together from a number of disciplines/fields.

After the lecture, a special presentation was made to two new Victorian Honorary Life Members: Jim Rowan and Professor Bob White. They were awarded special certificates and a short presentation was made by Mark Imhof covering their extensive careers in soil science.

Jim Rowan has been a member of ASSSI since 1954 and has served as Victorian Branch Secretary, Vice President and President as well as Federal Council Secretary. He had a distinguished career within the Soil Conservation Authority in Victoria and still contributes significantly in a voluntary capacity.

Bob White has had a long and distinguished academic career and has been involved in writing over 120 refereed journal papers as well as book chapters and key soil texts (such as 'Principles and Practice of Soil Science'). He has served as both State and Federal President of the Society and was instrumental in setting up the Certified Professional Soil Scientist (CPSS) accreditation scheme.

Drinks and nibbles were provided after the lecture – generously provided by the School of Land and Environment. The annual Leeper Lecture dinner followed and was attended by 25 people. This provided a great opportunity to catch up with old friends and meet new ones.

17th Professor GW Leeper Memorial Excursion

The annual Leeper Lecture excursion was held the following day, and on a wet and windy Saturday morning about 20 bold soil scientists boarded a bus bound for the Bacchus Marsh district. A 'companion notes' booklet was prepared for participants that included information relevant to each stop.

The first stop was at a site on a basalt landscape at Balliang East where the farmer has been applying biosolids for about five years. An interesting soil pit was examined on the site that generated a lot of discussion.

The second stop examined issues associated with land degradation in the Parwan Valley. Richard Hartland (ex Soil Conservation Authority) pointed out areas of interest within the White Elephant Hills Reserve, including gully and tunnel erosion, and dryland salinity sites, as well as previous attempts at rehabilitation.

The third stop visited the 'Triassic Council Trench Reserve' near Bacchus Marsh where Dr Roger Pierson (Deakin University) provided an overview of the geology in the area. This site is of significance in that it is the only recorded outcrop of Triassic rocks in Victoria.

The bus returned to the University of Melbourne at 4:30 pm and the bold (and slightly wet) soil scientists returned to their normal lives.

Australian Society of Soil Science Inc
PO Box 1349 Warragul Victoria 3820
Ph 03 5622 0804 Email office@asssi.asn.au Web www.asssi.asn.au ABN 96 080 783 106

Australian Society of Soil Science Inc
PO Box 1349 Warragul Victoria 3820
Ph 03 5622 0804 Email office@asssi.asn.au Web www.asssi.asn.au ABN 96 080 783 106