



ASSAY

A NEWSLETTER ABOUT ACID SULFATE SOILS

No 22. June 1999

Queensland ASS forum

The Queensland Acid Sulfate Soils Investigation Team (QASSIT) recently held a 3-day forum and technical course on the management of ASS. Queensland Minister for Environment and Natural Resources, Mr Rod Welford opened the forum and officially launched a state strategy for the management of ASS. The Qld. ASS Strategy includes awareness, education and training, mapping and assessment, planning management and environmental advice, research as well as development, policy, and regulation issues.

Mr Welford also launched several maps (1:100 000 and 1:25 000 scale) maps identifying the extent of ASS in South East Queensland. John Williams, Chairperson of NSW ASSMAC, spoke on the history of research and management of ASS as part of his presentation "ASS in NSW, the big picture". Dick Callinan, NSW Fisheries, presented a paper on behalf of Jes Sammut (UNSW) about ASS

leachate impacts to fish and oysters. (Unfortunately, Jes was unable to attend due to his fathers death) Dr Bill Dennison spoke on possible links between ASS and Lyngbya sp - a blue green algae outbreaks which can cause skin and eye irritations and disrupt commercial fishing operations.

Workshops covered ASS chemistry, geomorphology, field sampling equipment, and ASS management principles field assessment, mapping, research and community and perspectives. Day one attracted 240 participants while 150 people attended each subsequent day. Workshop participants identified a need for more information on relevant legislative requirements and asked for the roles of various state agency to be more clearly defined.

QASSIT has previously conducted a wide range training workshops in regional centres. The last major forum in South East Queensland was held at Nerang with Gold Coast City Council in 1997. Following feedback from the Forum, QASSIT officer, Kylie Hey says she will hold a range of educa-



Pictured at the recent ASS workshop in Brisbane which was opened by Queensland's Environment Minister, Mr Rod Welford were Howard Berndt, Qld Main Roads; Julie Anorov, the Land Resource Officer with QASSIT; and Harry Bannano, Chairperson of Canegrowers.

tion workshops adapted to the information needs of excavator operators and other specific stakeholders.

The 220 page course proceedings of the Forum are available in hardcopy (\$50) or CD (\$15) by contacting Julie Anorov, on 07 3896 9819 or 07 3896 9331, or E-mail: anorovj@dnr.qld.gov.au. The ASS Strategy is free.

NSW

NSW "Hotspots Report" published soon

An ASSMAC report on NSW ASS "hotspots" will be published later this month following extensive field work and desktop studies by a team from the Department of Land and Water Conservation (DLWC). The report identified and described the worst 20 per cent of ASS land that is probably contributing 80 per cent of the acid leachate. The 26 hotspots were distributed across eight major catchments, from the Tweed to the Macleay and also included Broughton Creek on the Shoalhaven River. DLWC officer Mitch Tulau interviewed councils, state agencies, researchers, and industry representatives during the survey. Hotspots characteristically extend over several properties, have low elevation, a known history of land degradation, low pH water and high density drainage with low flushing capacity in nearby receiving waters. The report identified a total of 50,000 hectares as being hotspots. The hotspot data will be used to help determine remediation and management options for drained, agricultural ASS areas. The hotspot reports will be available on request and will be posted on the ASSMAC web site. For further information please contact Mitch Tulau on tel 0265 631212 or email mtulau@dlwc.nsw.gov.au.

Technical Coordinating Committee

The NSW ASSMAC Technical Coordinating Committee will hold a three-day workshop at Lismore in late August or early September to debate various methods of remediation for degraded ASS areas and laboratory methods.

Technical Coordinating Committee Chairperson Ian White said acid drainage from broadacre agricultural developments on coastal ASS is a major and continuing threat to downstream ecology, fishing, aquaculture, recreation and tourism. Successful remediation measures have

been established for small, high-return developments on ASS and are evolving for some broadacre developments.

"The poor economic returns from broadacre farming, the legislative and institutional arrangements and the cost all pose problems to successful remediation," Ian said. In Australia the particular goals of broadacre ASS remediation are, in an economically realistic way, to:

- minimise downstream impacts from drainage and runoff,
- decrease acid storage and generation in the soil profile,
- maintain or enhance the productivity of the land-water system.

The workshop will consider remediation of broadacre agricultural areas and hotspot areas separately.

The objectives of the broadacre section of the workshop are to:

- critically review broadacre remediation methods,
- assess their potential environmental outcomes and feasibility,
- identify their strengths and weaknesses, and



QUALITY PROVIDERS OF

Water Monitoring Wells

GeoCoastal (Australia) Pty. Ltd. offers:

Advanced Geoprobe® soil coring and well installation technology to bring you rapid and efficient – therefore cost-effective installation of wells with:

- 50mm I.D. Class 18 lead-free PVC
- 600mm long, 100 µm mesh, 316 stainless steel wire-wound screens
- Threaded joiners (if required)

Informed well placement is ensured by core sampling at discrete depths if required.

Accessibility is no problem with the Geoprobe® rig mounted on 4WD or 8-wheel All Terrain Vehicle.

Please contact Dr Trevor Graham or Dr Rundi Larsen:

GeoCoastal (Australia) Pty. Ltd. 7 Britannia Street Manly, Queensland 4179 Australia	Ph: 07 3348 5691 Fac: 07 3348 3100 Mobile: 0417 487 968 Email: GEOCOASTAL@bigpond.com
---	--

- identify knowledge gaps and research needs.

The objectives of the hot spot section of this workshop are to:

- review the site characteristics,
- identify possible problems with the site including acid fluxes, detail the remediation options, assess potential problems.

The workshop will also review laboratory and field methodologies. "The potential threat posed by ASS in terms of their sulfide concentrations have evolved to the point that some governments are considering enshrining particular laboratory methods in legislation. In some areas the excessive costs of assessment techniques threaten the viability of projects particularly in the agricultural sector," Ian said.

Attendance at the workshop is limited to invitation only as its aim is to undertake a detailed technical evaluation of current analytical and remediation technologies. A workshop proceedings will be published.

For further information about the workshop please contact either Peter Slavich on 0266 261 345 or Leigh Sullivan on 0266 203 742, or Ian White at email: ian.white@cres.anu.edu.au

Byron Shire Council ASS management

Byron Shire Council recently appointed a senior environmental planner Peter Helman to oversee the Shire's estuary, coastal and state of environment reports. One of his first tasks will be to finalise an estuary management plan for Belongil Creek which includes ASS remediation. The council recently launched a draft ASS LEP for Byron Shire. Peter says there has been a lot of responses to the LEP from developers, landowners and environmental groups. Peter will coordinate various existing and new environmental studies and assess ASS remediation proposals. Peter has a background in resource management, water planning and biodiversity management. For further information please telephone Peter Helman at Byron Shire Council on 6626 7000.

NSW FARM NEWS

Farmers ASS trip

A group of farmers from the Manning, Hastings and Macleay catchments recently travelled north by

coach to visit tea tree growers, graziers and cane farmers who are pioneering new ASS management methods.

The two-day trip was coordinated by the Macleay Acid Sulfate Soil Local Action Group in conjunction with Scott Henderson, a ASS Project Officer based at Kempsey. The group visited the Oceania Tea Tree Plantation near Port Macquarie to view laser-levelling, drain water management, groundwater and drainwater monitoring as well as drain maintenance works.

At Clybucca, Mike Dutton, from Kempsey Shire Council explained the Seven Oaks Drainage Union Water quality monitoring project. The group also visited Alan Morris's grazing property to view low weir structures used to rehabilitate acid scalds.

At the Clarence River they visited grazing areas on which penstocks (small floodgates used to keep water on back swamps) enable wetland pasture on Roy Bowling's Coldstream River property. At Swan Creek the group studied floodgate structures and how management committees (under the Local Government Act) can manage floodgates. The group also visited a sugar cane farmer on Woodford Island whose extensive landforming and storm water management is applicable to ASS land. Scott Henderson said the trip enabled farmers to swap ideas and learn first hand the benefits of changed water management practices, as well as the costs, legal issues and limitations of various ASS management techniques.

For further information please telephone Scott Henderson on 0265 626244.

ASS plan for NSW cane farm

Tweed River cane grower and ASSMAC member, Robert Quirk, has drafted an Assessment of Acid Hazard and Drain Management Plan for his property. The plan contains a map of the farm marking field and major drains plus the results of soil cores taken as part of industry-wide ASS testing project. The plan includes details of lime application, laser grading and cleaning of drains. For further information please contact Robert Quirk on tel 0266 777 227 or 0415 454927.

Benchmark survey

A series of focus meetings are being held in regional NSW to provide feedback to farmers about a benchmarking survey which measured farmer

knowledge levels about ASS and changes in management practices. The telephone survey of almost 300 farmers was done across major coastal catchments. Project Coordinator, Alice Woodhead says the focus meetings will help participants understand the results of the survey and how the information will be used to develop educational material.

The survey shows that the NSW sugar cane industry has made ASS a focus and is ahead of other industries in awareness and knowledge levels. More than 60 per cent of those surveyed believe that consideration of ASS issues is important in farm planning and management. However, the beef industry contained the largest proportion of farmers who feel ASS management is beyond their control. "Farmers appreciate an opportunity to show their views on the future management of ASS," Alice said. (Feedback from the focus meetings will be published in the next issue of ASSAY). The results from the initial survey are presented in two formats, a technical report, Benchmarking ASS 1998 and a synopsis ASS Farming Community Ideas about the Way Ahead.

For further information, or to get these reports, please contact Alice Woodhead on telephone 0266 261215.

Clarence River drain action

Clarence River farmers are gaining confidence in managing floodgates to improve water exchange in drains according to Alan Cibilic from the Clarence River County Council (CRCC).

"We are installing winches (at up to \$6,000 per site) so farmers can operate floodgates according to a management plan agreed to by all affected landholders," he said. Alan says the advantages of floodgate management include:

- improved drain water quality,
- use of saline water to help neutralise acid water,
- strategic use of saltwater to control weeds,
- improved fish passage.

At some sites extended wetland inundation is also possible. CRCC has signed floodgate management plans with landholders on three drains, with another six under negotiation. "Early interest came from farmers with grazing properties or water

extraction licences, usually further upstream where the river water is more frequently fresh. Now farmers near the river mouth are interested. One group on the Coldstream River are opting for mini-sluice gates (a aperture within a floodgate). This pilot project may lead to cheaper floodgate management alternatives.

For a copy of floodgate management protocol or for more information about the Clarence River Floodplain Project telephone Alan Cibilic on telephone 02 66423277.

Cheap lime source

A by-product from power generation in the Hunter Valley may prove a cheap alternative to mined lime for farmers wishing to treat ASS land on the Central Coast and Hunter region. Macquarie Generation removes minerals from the 'hard' Hunter River so it can run pure water through its coal-fired boilers at Bayswater and Liddell power stations. It has been generating 30,000 tons of lime a year, with a total 450,000t stockpiled. Lyme Regis Agricultural Products plans to sell the lime material to farmers. The product is registered with NSW Agriculture as a fertiliser. Price at source is about \$25/t with significant discounts for big orders making it about \$5/t cheaper than mined lime. For further information contact Clive Troy Marketing Manager with Lyme Regis on tel 02 94841635.

QUEENSLAND FARM NEWS

CSR Sugar Mills Herbert River - Soils Project

CSR began mapping the soils of the Herbert cane growing area in 1982. The original team was led by Dr. Andrew Wood who was assisted by Ron Rutherford and Sam Pennisi.

Approximately 65% of the area has been mapped to a scale of 1:5000. The mapping is supported by a soil analytical data base, with soil physical and chemical data for over 1000 soil profiles including ASS. It represents the most comprehensive soil data set for any sugar cane area in Australia.

Statistical analysis of the physical and chemical data from the detailed soil survey in the Herbert has

confirmed that the soil mapping units delineated in the soil survey on the basis of soil morphological criteria (colour, texture, drainage and position in the landscape) also represent areas with significant differences in soil properties. Preliminary attempts at cluster analysis have shown that it is possible to group the 24 soil mapping units into four or five soil clusters having similar physical and chemical characteristics. The maps are being digitised by the Department of Natural Resources, Mareeba. For further information please contact David Horsley - CSR on (07) 47764237.

NHT helps develop new Qld ASS Cane guidelines.

The Queensland Environment Protection Authority has employed four officers to work with Queensland sugar industry Local Boards to develop environmental guidelines for growing sugar cane.

Large northern wetland tracts, many underlain by ASS, have been cleared and developed. There is now pressure to develop new coastal areas to expand the State's \$1.3 billion sugar industry. Each sugar mill area now has a Local Board consisting of cane grower and miller representatives. Under the new Sugar Industry Act, which may be operational in 2000, the local boards will have expanded responsibility to establish which areas are appropriate for sugar cane expansion.

The Sugar Industry Liaison Officer (SILO) at Bundaberg, George Martin says the guidelines mirror the industry's emphasis on sustainable production which are embodied in the Code of Practice for Sustainable Cane Growing in Queensland.

"The cost of remediation of affected ASS areas, in comparison to the income derived from development, make it vital to improve the awareness, understanding and appropriate management of ASS," he said.

Extended digital mapping of ASS, especially outside the south eastern region, and up-to-date research findings and technical information by the Queensland Acid Sulfate Soils Investigation Team of the Department of Natural Resources will provide a valuable resource for future land use decision-making in all coastal areas.

The Federal Natural Heritage Trust has partly funded the SILO project.

The other SILO officers are: Maree Cali (Mackay); Peter Morrison (Townsville); Ben Jacobsen (Cairns).

For further information please telephone George Martin on (07) 4153 8012 or Fax: (07) 4153 1478

Rocky Point - Southern Queensland

At two Rocky Point sites in Southern Queensland, scientists Ted Gardner, of Department Natural Resources, and Freeman Cook, of CSIRO, are researching the generation and export of acid due to sugarcane farming.

Acid can be created through the hydrolysis of jarosite or by the oxidation of pyrite. The scientists are measuring the acidity, iron and aluminium created by both of these processes. Measuring the amount of acid and metals being exported has involved wrapping cane paddocks in plastic, installing agricultural drains and measuring the groundwater discharge and its chemical composition. The scientists can now predict acid export rates for similar situations. The information will help develop specific strategies for managing acid production through both the pyrite and jarosite processes. Growers will be able to use this information for designing drains and paddocks to help minimise the amount of acidity and metals being exported. It will also help the industry to determine what type of soils are unsuitable for sugarcane farming. For further information contact patricia.kennedy@crc-sugar.jcu.edu.au

Environmental Analysis Laboratory

Southern Cross University
Centre for Coastal Management
Northern NSW

Research & Consultancy Service

- Low cost soil screening
(soil preparation and preservation, pH, EC, total LECO sulphur/carbon)
- Water acid leachate analysis
- Soils POCAS, TPA, TAA, POSA, TOS, NAGP analysis
- Organic/Pyritic sulfur differentiation (i.e. using chromium reduction analysis & electron microscopy)

For further information contact:
Graham Lancaster
Tel: (02) 6620 3678 Fax: (02) 6620 3957
Email: g lancast@scu.edu.au




Drain redesign

A Richmond River cane farmer has redesigned 3 kms of farm drains to prevent disturbance of ASS and improve off-farm water quality.

The Tuckean Landcare Group is supporting the project on Wayne Gollan's farm at Dunganubba, near the Richmond River.

Broadwater Sugar Mill's Manager of Agricultural Services, Peter Nielsen said the new drain design will reduce acid entering river systems.

The Federal Government's Natural Heritage Trust is jointly funding the \$8,000 project which includes an in-kind contribution by Mr Gollan.

"The existing deep and square shaped drains

now have a wide and shallow U-shaped profile making it cheaper and easier for farmers maintain.

"The lime incorporated in the now higher drain base has improved the water from pH 4 to 6," Peter said.

"Many coastal drains are between 30-60 cms deeper now than when they were first dug.

This is due to years of drain cleaning by excavator buckets. Drain redesign, and better maintenance methods (ie new reed bucket) will help address this problem," The project was coordinated by the Tuckean Landcare Group's Coordinator, Michael Wood, and is part of the Tuckean Swamp Land and Water Management Plan. Peter said.



QLD

East Trinity CSIRO report

The Parliamentary Secretary to the Minister for Science, Warren Entsch last month launched a detailed CSIRO report on the ASS impacts on Trinity Inlet at Cairns. It estimated that the site has generated 120,000 tonnes of sulfuric acid since 1976, when 700 ha of mangrove swamp were drained and cleared. The site is within Warren Entsch's electorate. Other key findings are that acid has been produced at 190 times the rate for (undrained) temperate Australian ASS, that water discharged into Trinity Inlet contains dissolved aluminium between 120 and 6000 times the ANZECC guidelines. It also found iron precipitates enriched in arsenic and zinc flush into the inlet and that there is possible contamination of flora and fauna by arsenic and zinc released from ASS weathering.

Two successive developers, including current mortgagee-in-possession Natwest Markets (UK) have tried to turn the site into a mini city housing 25,000 people.

Natwest Markets consultant, Gary Hunt has been quoted in the Brisbane Courier Mail recently as saying that acid remediation would be expensive and development would help offset costs of fixing the problem. However, Save Trinity Inlet spokesman Jonathan Metcalfe has called for the site to be returned to its original state.

The launch of the latest CSIRO report was part of a workshop conducted by Dr Rob Fitzpatrick and

Mr Warren Hicks (CSIRO). It involved a field trip and covered topics such as the site history, surface precipitates, chemical and mineral plus rehabilitation options. Dr Greg Bowman, who is now Principal Scientist with the NSW Department of Land and Water Conservation previously led the project. Greg says that East Trinity has one of the highest pyrite contents for ASS in Australia. "It was initially drained for sugar cane production by CSR, but proved too acidic. As the ASS dried each dry season the site has subsided by about a metre (in total) and is now under regrowth with melaleuca trees. The weathering processes still continues on a seasonal basis with active oxidisation within the soil profile. "Much of the acid is not coming out in a form we would normally measure (ie hydrogen ions) but as ferrous iron and dissolved aluminium, which are oxidising to produce acid offsite," Greg said.

For further information please contact Warren Hicks on 02 6246 5949 or Marko Zagar 0262774656 or 0419 286385.

NATIONAL

Draft National Strategy goes forward

The National Working Party has delivered a Draft National Strategy on Coastal ASS, to the Sustainable Land Water Resources Management Committee (SLWRMC). If satisfied with the draft, SLWRMC, will forward it for endorsement to the Standing Committee on Agricultural and Resources Management (SCARM). National Working Party Chairman, John Williams said that

The WATER OF LIFE filmstream

... an in-depth resource video production combining best science with explicit photography and computer imagery.

Volume One: **Aussie Estuaries - Finding Solutions to Acidity**

- presents the initiatives of qualified researchers and landowners to remedy acid-sulfate soil reactions, to improve water quality.
 - Call, fax, post or email us for information and to order your copy - \$59 delivered, with 30-day money-back guarantee.

OUT OF THE BLUE Ocean & Earth Films

ph/fax 02 6685 7456 - mobile 0416 239957 - outofblu@nor.com.au - PO Box 583, Byron Bay 2481 Australia

Other volumes: • The Nature of Water • Potable Water • Storage and Reticulation • Re-use of Human Effluent
• Wetland Design and Care • Composting Biosolids • Biological Nutrient Removal • Forest Hydrology

- please call for filmstream outline

submissions from consultants, developers, government agencies, councils and interested groups were received after the Draft was exhibited for public comment earlier this year. The terms of reference cover implications of existing land use practices, environmental, social and technical issues which require a national approach, plus the resources, roles and responsibilities of the relevant state and federal agencies.

An electronic version of the draft National Strategy can be viewed at <http://www.dpie.gov.au/dpie/armcanz/pubsinfo/ass/ass.html>

Eureka Award to ABC

Michael Troy, the ABC's environment reporter who last year presented a series of stories on Queensland and NSW ASS issues recently won the \$10,000 Peter Hunt Eureka Prize for Environmental Journalism.

Michael Troy, won the award for his development of a collection of television news and current affairs reports on Hinchinbrook channel development, the effects of acid leachate on fisheries and oyster growers as well as a range of other environmental issues

The Award are run by the Australian Museum. Museum Director, Professor Mike Archer said 1999 marked the Australian Museum Eureka Prizes most successful year, with a prize pool totalling \$100,000. On hand to present the Prizes were Senator Robert Hill, Federal Minister for the Environment and Heritage, and Bob Debus, NSW Minister for the Environment.

ASS EDUCATION

"Acid in Paradise" ASS video

Acid in Paradise, a 25 minute video about ASS is now available for purchase from NSW Agriculture. The video features animation on how pyrite formed, how oxidation has occurred as well as the impact of acid on waterways. It contains interviews with fishermen, oyster growers and farmers on current best management methods. The video was produced by Ian White in association with Maria Taylor from Media Associates, and was supported by the NSW Government's Acid Soil Action program. To order a \$25 copy (this includes postage) please telephone Eileen Tucker on 0266 261 347 or

fax your request to 0266 281 744.

Byron Bay ASS video

Byron Bay's Out of the Blue Ocean and Earth Productions is currently editing a video on ASS impacts and remedies for the Belongil Catchment near Byron Bay. The video has aerial footage of the drainage network, field work, water sampling and commentary by local researcher David Pont. Producer Martin Selecki is hoping to attract a regional television station to screen the video. For further information please contact. Martin Selecki on tel 66 857 456. outofblu@nor.com.au.

ASS CD ROM for Africa

English based ASS researcher David Dent recently wrote with the following news: The CD ROM-based system for ASS begun seven years ago in CSIRO Soils by David Dent and Greg Bowman is now operational in West Africa. The regional version has been supported by the African Development Bank, initially for the Gambia Low lands Development Project which faces some 150 000 hectares of sulfidic soils with Total Potential Sulfidic Acidity values of up to 3750 mol+ m³ (that's 12 per cent S by mass). The Gambia climate



**Australian
Environmental
Laboratories**

**ACID SULPHATE SOILS
AND
RELATED SOIL PROFILES**

Our network of quality assured laboratories is able to provide Rapid, Reliable and Responsive services for the analysis of Acid Sulphate Soils conforming to the legislative requirements of the various state authorities. Recognised analytical protocols have been adopted to cater for unique situations.

- POCAS (method 20)
- NAGP (NAPP)
- ANC
- Sulphate Sulphur
- TOS (method 21)
- TPA (NAG)
- Total Sulphur

For further assistance relating to the above services or any other analytical requirements please contact our Senior Projects Manager toll free on 1800 806 568.

has nine months without any rain then, in a good year, three rainy months when the tidal river runs fresh, enabling crops of rice. Attempts to extend the freshwater season by excluding the salt tides have resulted in actual ASS because evaporation behind the salt exclusion dykes has lowered the watertable into the sulfidic subsoils. This has damaged rice crops. An advantage of the CD ROM system is that it can be adapted regionally with local versions produced and updated continually at little cost.

Work is now in hand on a CD ROM soil survey and laboratory trainer.

For further information contact David Dent on 09:35:52 +1000 or D.Dent@uea.ac.uk

Internet fishkill site for Qld.

North Queensland recreational fishing group, Sunfish, has launched an internet site with details of more than 30 recent fishkills linked to drained ASS and agricultural impacts. Descriptions of fishkill locations, as well as site history, photographs, and official government reports are recorded for each major fishkill in North Queensland in the past 18 months. Sunfish's Vern Veitch says that increasing numbers of fish kills are attributed to low dissolved oxygen levels in water. "This can be caused by iron from ASS moving to waterways and oxidising, or it can come from organic matter decomposing, or a combination of impacts," he said.

Vern says that he will meet with the Queensland Minister for the Environment, Rod Welford, soon

to discuss recreational fisher concerns about loss of habitat and to seek funding for water quality research. The fishkill internet address is: <http://www.beyond.net.au/sunfish/main99.htm>.

RESEARCH

Laboratory methods update

Laboratory methods involving oxidation using hydrogen peroxides (POCAS is one of these methods) are subject to significant interference by even moderate amounts of sulfate minerals and organic matter according to Ass. Prof. Leigh Sullivan from Southern Cross University (SCU).

"The errors in reduced inorganic sulfur determinations made using hydrogen peroxide oxidation methods are often larger than the action criteria that are currently used to identify ASS (ie those in the ASSMAC Assessment Guidelines)" Leigh said. "Consequently, there is a very high risk of mis-identification of ASS (either through false-positive or false negative results) for soil with low reduced inorganic sulfur contents," he said.

SCU's Centre for Research on ASS (CRASS), has written to ASSMAC recommending that Method 22B, (ASSMAC Laboratory Guidelines - August 1998) - replace the "sulfur trail" used in the POCAS (21E or Spos) Method. "The sulfur trail is currently recommended in laboratory guidelines as the soil property that should be initially used to calculate the potential acidity risk and CRASS endorses this recommendation," Leigh said. "The chromium reducible method also has the advantage



Five Crowns Lime

- High calcium to magnesium ration of 5.
- Average neutralising value of 85% calcium carbonate equivalent.
- Ultra fine nature & low hydrated lime content > rapid neutralisation.

Ideal for pasture crops, acidic waterbodies & acid sulfate soils

For a free fact sheet contact Lyne Regis Pty Ltd
Ph 02 9980 8077 Fax 02 9484 2427 ses1@ses1.com.au

ACN 082698708

of being quicker and can be done with readily available laboratory equipment," he said. The Chromium method - like the sulfur trial of the Pocas method, is aimed at determining the total acidity potential, and the management and risks analysis based on adding neutralising values may also take into account appropriate methods for determining liming acid neutralising potential. (see chapter 6 of the ASS manual Laboratory Guidelines.)

The SCU results "Comparison of peroxide oxidisable sulfur and chromium reducible sulfur methods for determination of reduced inorganic sulfur in soil" were published in the Australian Journal of Soil Research, 37: 25 5-65; (L.A Sullivan, R.\ Bush, D. McConchie, P. Haskins and G. Lancaster, 1999). copies are available from Leigh on tel 0266 203 742.

NB The ASSMAC Technical Coordinating Committee plans to discuss this issue at its next meeting.

University "CRASS" team formed

Southern Cross University (SCU), Lismore, recently established a Centre for Research on Acid Sulfate Soil (CRASS) within the Centre for Coastal Management. This means Australia now has the largest centre for ASS research in the world.

Members of CRASS have wide expertise in the areas of soil science, sedimentology, geochemistry, hydrology and aquatic ecology and land management, chemical analysis. SCU staff members of CRASS include, Ass Prof. Leigh Sullivan, Assoc. Prof. Dave McConchie, Richard Bush, Dr Chuxia Lin, Prof. Peter Saenger, Prof. Leon Zann, Dr Brad Eyre, Malcolm Clark, Graham Lancaster plus four postgraduate students.

The aims of the Centre are to:

- research that contributes to the understanding and improved management of ASS,
- provide undergraduate, postgraduate and continuing professional education that will equip students to work effectively on ASS-related issues,
- provide consultancy services to both government and non-government agencies
- promote awareness within the community and amongst professionals of the value of understanding ASS through publications, professional short courses, exchange programs and other means.

Members of the CRASS are developing new methods for ASS identification and the estimation of acidification potential, examining processes involved in oxidation and reduction, examining interactions between ASS management and the health of terrestrial and aquatic environments, and investigating innovative methods for ASS management and rehabilitation. SCU has a commercial/research laboratory and a electron microscope with x-ray analysis facility.

Researcher David Dent heads down under

International ASS researcher and author, David Dent is moving from England next month to take up a position as a reacher group leader with the Federal Government's Bureau of Rural Science The BRS is the research arm of Federal Agriculture Fisheries and Forestry Australia.

David will be responsible for managing the Division of Land and Water Sciences' land based research activities including rural land degradation issues such as dry-land salinity. Chief Land and Water Scientist, Dr Colin Chartres says David will help the Bureau extend its ASS work, especially the management issues of coastal aqua-culture development. David is the author of book, Soil Survey And Land Evaluation. David Dent Anthony Young George Allen & Unwin, 1981; and also Acid Sulfate Soils A - Baseline For Research And Development. Elier publication No 39.

For further information, please contact Colin at email: colin.chartres@brs.gov.au or tel 02 62499267.

New monitoring well technique

Brisbane-based GeoCoastal (Australia) Pty. Ltd. has recently introduced to Australia a new hammer drilling method for installing water monitoring wells on ASS floodplains which should save time and money.

The method involves Geoprobe® technology - a unique push coring/hammer drive system to install high-quality, economical, 42 and 50 mm I.D wells. This enables sampling via suction lift pumps (vacuum or peristaltic) or 12V electric pumps (eg 'Amazon'). Soil cores can be taken continuously or at discrete depths immediately prior to well installation if the depth to watertable needs to be determined, and no surface spoil is produced.

The company also conducts ASS surveys using geomorphic modelling to map the subsurface of development sites. This approach is fully endorsed by Queensland regulatory authorities and typically reduces the density of expensive drilling and sample analysis by more than 50%.

Trevor and his partner, Dr Rundi Larsen previously worked for Federal Government's Australian Geological Survey Organisation, where Trevor ran the coastal program, before establishing a consultancy at Manly, Brisbane. For further information please contact Trevor or Rundi on: Ph: 07 3348 5691; Fax: 07 3348 3100 or Email: GEO-COASTAL@bigpond.com.

Coastal, inlands & minesite ASS paper

The National Land and Water Resources Audit Methods Paper on ASS by Rob Fitzpatrick and co-workers summarise the key information and results for coastal ASS (tidal mangrove swamps), inland ASS (non-tidal scalds driven by saline acid-sulfate discharge conditions) and minesite ASS (waste rock stockpiles or tailing impoundment). Rob says that the information should now be brought together and assessed nationally.

"The National Strategy recently developed by the National Working Party on Coastal Acid Sulfate Soils is an important first step in the national recognition, coordination and management of resources to ensure that coastal ASS are assessed and managed in a responsible manner," he said. Conditions of inland ASS are less well-known - but can cause loss of grazing and cropping land, contamination of dams, plant loss and damage to buildings. The affected area is growing and is closely linked to the spread of salinity which is threatening large farming areas.

Rob says that inland and minesite ASS conditions have not been adequately assessed nationally because of the poor state of knowledge of these forms of inland ASS potential areas. "The methods paper shows how various common properties of ASS conditions for a variety of environments should be brought together and assessed with standard methods across Australia. Modern methodologies are proposed to produce a national map (1:2 million scale) as well as representative transect scale assessments of selected priority areas to predict areas at risk using classifications at different spatial scales (national, regional and catchment). This could establish a framework for national com-

munication and implementation of technologies, which identifies economic, social, health and legal assessments and available options for amelioration and management.

For further information contact Rob Fitzparick at CSIRO Land and Water on (08) 8303 8511 Fax 08 8303 8550.

University of NSW news

1 Soil mapping, Indonesia

Jes Sammut and University of NSW students, Loren Ravenscroft and Dave Escudero, have mapped ASS overlying a limestone piedmont in South Sulawesi, Indonesia. Joelle Gergis and Annabelle Keene, also from UNSW, assisted with field work and laboratory activities. The soil-mapping program is linked to an ACIAR project on the amelioration and management of ASS-impacted shrimp ponds in Indonesia coordinated by Jes. ASS has been inadvertently excavated for shrimp farming in many areas in Indonesia leading to low farm productivity and socio-economic impacts. Previous soil mapping in South Sulawesi and other parts of Indonesia has ignored large areas of pyritic sediments.

The ASS maps will be used in an epidemiology study of shrimp health problems in the area and to investigate production problems that may be linked to ASS rather than disease. The ASS maps will also be used by local planners to ensure that shrimp farms and other land uses do not disturb ASS. GIS and remote sensing approaches are being applied to improve the mapping.

The umbrella project is progressing well and trials on the amelioration and management of degraded ponds in ASS will commence in the latter half of this year and continue until 2001. A soil and water laboratory that specialises in ASS has been established by UNSW and ACIAR at the Research Institute for Coastal Fisheries in Maros to resource the project. The Institute will become a Centre for Excellence in Sustainable Shrimp Farming with a focus on sediment management.

For more information contact Jes Sammut on j.sammut@unsw.edu.au

2. Indonesian ASS researchers

Jes recently hosted four Indonesian researchers involved with his ACIAR shrimp pond remediation study. Dr Adi Hanafi, Mr Brata Pantjara, Mr

Akhmad Mustafa and Ms Rosiana Sabang who visited the School of the Geography as part of the scheduled training and project coordination activities. The visiting researchers participated in a workshop on applications of GIS and remote sensing as well as training in ASS analytical methods. Elements of the training sessions involved Jes Sammut, Ping Wang, Dr Richard Lucas, Dorothy Yu, Chris Myers and Annabelle Keene. The Indonesian researchers are responsible for the management of shrimp ponds in ASS throughout the Indonesian archipelago and will undertake a number of training workshops to build their expertise over the next three years. Australian research has been fundamental to ASS management in Indonesia and the collaboration between the two countries is mutually beneficial.

3. Cattai creek

Leisel Sonter, UNSW, is undertaking an honours study of acid discharges in Cattai Creek, Manning River with financial assistance from ASSPRO funding. The study is looking at rates of acid production and export in an area immediately upstream from oyster leases. Oyster production losses have been linked to acid plumes that penetrate into the main river channel. The study is linked to Mike Dove's PhD research and Jes Sammut's Federal Research Development Corporation study on risk factors for poor oyster production. Manning River oyster farmers also support the research.

For more information contact Jes Sammut on j.sammut@unsw.edu.au

4. ASS oyster impacts

Geographer Michael Dove presented a paper on environmental factors causing production losses in Sydney rock oysters to a recent World Aquaculture Society Conference held at Darling Harbour, Sydney.

This is a major project which is funded through the Fisheries Research and Development Corporation with assistance from NSW Fisheries. The project is studying production on NSW's Hastings, Maria and Manning Rivers. The Sydney rock oyster which grows along the NSW Coast and industry generates about \$25 million worth of production annually. Experimental laboratory and field exposure to acidified waters shows oyster impacts include shell dissolution; soft tissue damage; death in juvenile and adult oysters; and interference to oyster feeding. "While an oyster shell acts as a good defence against acid water, and the lime in the shell can buffer acid leachate, there is a limit to number of times it can be exposed to acid before it is either damaged or killed

For further information (UNSW) 9385 6211 (j.sammut@unsw.edu.au). or Michael Dove (UNSW) 6582 2721.

ASS CALENDAR

Excavator Operator ASS Information workshop - Maclean June 23, 7pm contact Jon Woodworth 0266 261 344

ASSMAC - Sydney August 9-10

ASS Remediation Workshop ASSMAC Technical Coordinating Committee - August/September TBA.

ASSAY is published quarterly for the acid soils information and awareness program which is funded by the Federal Governments Natural Heritage Trust.

Editor: Jon Woodworth

Internet site: <http://www.agric.nsw.gov.au/Arm/acidss/index.html>

Address: C/o Assay Editor
NSW Agriculture
WOLLONGBAR NSW 2477

Phone: 02 66261 344

Fax: 02 66281 744

email: jon.woodworth@agric.nsw.gov.au

Typeset and design by Sharon Bailey