

ASSAY

A NEWSLETTER ABOUT ACID SULPHATE SOILS

No 18. June 1998

Senate Inquiry for Port Hinchinbrook project

The Federal Government will hold a Senate Inquiry into allegations about environmental monitoring and regulations for the \$100 million Port Hinchinbrook development which is being built in an ASS area in North Queensland.

Written submissions dealing with environmental impacts on the Hinchinbrook Channel close on June 30 and Inquiry hearings will be held in Cardwell, Brisbane and possibly Canberra during late July. Four independent scientists have recently investigated the site and the inquiry will allow evidence to be given under parliamentary privilege.

A spokesman for Senator Woodley was quoted in the Australian Financial Review (May 15, 1998) as saying "freehold development can't be stopped but there are a range of options available to protect the soil and the environment." The newspaper reported that the developer, Mr Keith Williams welcomed the inquiry as a chance to "clear his company of ongoing accusations".

For further information, telephone Senator Woodley's Brisbane office on 07 32529129.

Blue green algal may link to ASS

Seasonal Lyngbya (cyanobacteria) algal blooms in Deception Bay and Pumicestone Passage, just north of Brisbane, during January to March each year may be linked to iron rich ASS leachate.

Dr Eval Abal from the University of Qld is investigating possible links to high total metal concentrations in ground-water loads in the southern Pumicestone Passage and other parts of Moreton Bay. Algal blooms have been recorded since the early 1990s. The area has low nitrogen and phosphorous concentrations (the usual causes of algal problems) in water and sediments. Dissolved iron has been observed to stimulate N fixation rates. ASS leachate from residential or agricultural developments can release large quantities of iron, alu-

minium and heavy metals from soils. The Pumicestone Passage Integrated Catchment Coordinator, Peter Oliver says the wind often blows large masses of rotting algae on shore where it gives off a strong sulfur smell. "Lyngbya causes asthma, dermatitis and eye irritation while the ecological impacts include fisheries loss from seagrass smothering as well as nitrogen fixation and odour problems," he said.

For further information telephone Eva Abal, University of Queensland email E.Abal@botany.uq.edu.au or telephone her on 07 34036135. (This article summaries a Brisbane River and Moreton Bay Newsletter, issue no 1, February 1998. This research is a joint federal, state and local government project under the National Landcare program)

Seawater neutralisation suits development

A Queensland consultant, Peter Scott, of Woodwood Clyde Pty Ltd says that seawater neutralisation of ASS leachate may prove to be more environmentally sound than chemical treatments such as hydrated lime.

"Hydrated lime is difficult to incorporate with on site water and results in freshwater being discharged into a seawater environment," he said. "Site treatment on a development at a Bribie Island residential estate involves using agriculture lime on drains flowing to a "polishing" pond. Peter says that the seawater neutralisation method is being trialed with approval from the Qld Department of Environment and Department of Natural Resources. Seawater is pumped to the ponds and mixed at the rate of about six parts sea water to one part construction water. The ponds discharge between 1000 and 3000 cubic metres on the outgoing tide with a minimum pH of 6.5. The water is allowed to stabilise and tested to ensure water quality of no less than 500 micrograms of aluminium per litre and 1 milligram per litre of iron. Suspended soils are kept to less than 50 mil-

ligram per litre. The dissolved oxygen level is above 6 milligrams per litre.

"Using seawater is much cheaper than lime treatments as well as being easier to manage. "The settling pond ensures that sediment such as iron floc settles before release while a silt curtain provides a safety net," Peter said.

For further information, please telephone Peter Scott on 07 33647444 or fax 07 33647477

Landcare tax rebate

The Federal budget contained a tax rebate and credit for landcare works - backdated to the 1997-98 financial year. The rebate will be restricted to primary producers with taxable incomes of up to \$20,700 per year from primary production, the Federal Primary Industries Minister Mr Anderson announced.

The government will use \$80 million a year from the Natural Heritage Trust to fund a 34 cents in the dollar tax rebate for on-ground landcare works. Enabling Legislation will soon be introduced into Parliament and is expected to be supported by all political parties. The rebate will apply to the same works that would qualify for current tax deduction for either preventing or treating land degradation.

The application of lime to ASS drains to improve water quality can qualify for the rebate if the works are for capital expenditure. The tax rebate is limited to \$5,000 per taxpayer annually. For further information contact your local accountant or try the Federal Department of Primary Industries helpline on 1800 026222.

National Land and Water Audit to include ASS

The Federal Government is undertaking a \$29.4 million audit of soil and water quality across Australia.

The four-year project started in December 1997 and will cover seven main areas:

- water quantity
- dryland salinity
- vegetation cover and condition
- rangeland monitoring
- landuse change/diversity, sustainable agricultural and product prices
- capacity and opportunity for farmers to implement change and
- estuary catchment and river health.


ASS have been included in the audit. This work is being coordinated by Dr Rob Fitzpatrick from CSIRO's Division of Soils, Canberra. The audit project is funded through Natural Heritage Trust (NHT) and will link with other NHT projects and state agencies. The audit's Geographic Information Systems database will help governments decide funding priority for environmental and productivity programs. Much of the survey work is expected to be done by consultants.

For further information contact the Audit's Technical Manager Methods, Warwick McDonald on 02 62 579516.

QLD body to coordinate mosquito research

Members of the Local Authorities Research Committee (LARC), which comprises a number of councils in south east Qld, has employed two entomologists to research mosquito health issues. Associate Professor Brian Kay from the Qld Institute of Medical Research chairs the committee.

While LARC is mainly concerned with mosquito to control it has developed a protocol for minimis-



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ing the effects of ASS disturbance during mosquito control activities. The protocol was drafted in association with the Qld Department of Fisheries, Department of the Environment and staff from Griffith University, as well as Tweed Shire Council. Craig Jennings, an entomologist at Redcliffe City Council, says mosquitoes pose an increasing threat to public health and those breeding in ASS areas need special treatments.

Meanwhile, the potentially fatal brain disease, Japanese encephalitis was recently discovered in a wild pig herd on Cape York. Unlike dengue fever, the disease is able to survive in temperate regions and is expected to eventually spread to NSW and Victoria. The disease kills 30,000 people in Asia annually, and several people in the Cape York have recently had the disease.

For further information, Craig Jennings on telephone 07 3283 0423 or email Craig_Jennings@redcliffe.qld.gov.au

ASSPRO projects update:

ASS video

Maria Taylor from the Water Research Foundation of Australia is currently drafting a script for an educational video about ASS as part of NSW Acid Soil Action program. The video will look at the history of the problem, the impacts of ASS on waterways, fisheries and oysters as well as the methods being used by cane farmers and other land users to improve water quality.

It will be suitable for schools, universities, landowners, and environmental groups and should be available later this year. For further information please telephone Maria Taylor on 02 6249 0651.

Berry water table trials

A \$26,000 ASS research project underway at Berry will determine how drain weir structures can help maintain water tables in paddocks at varying distances from large drains. Bruce Blunden, former Environment Officer from the EPA, Grafton, is undertaking the research as part of his PhD studies at Wollongong University.

"We are finding a similar effect to paddocks under cane production on the Tweed River - during dry times water table in middle of paddocks (ie furthest point from drains) is lower than the watertable near the drains," Bruce said. After rains which followed a recent extended dry season, the

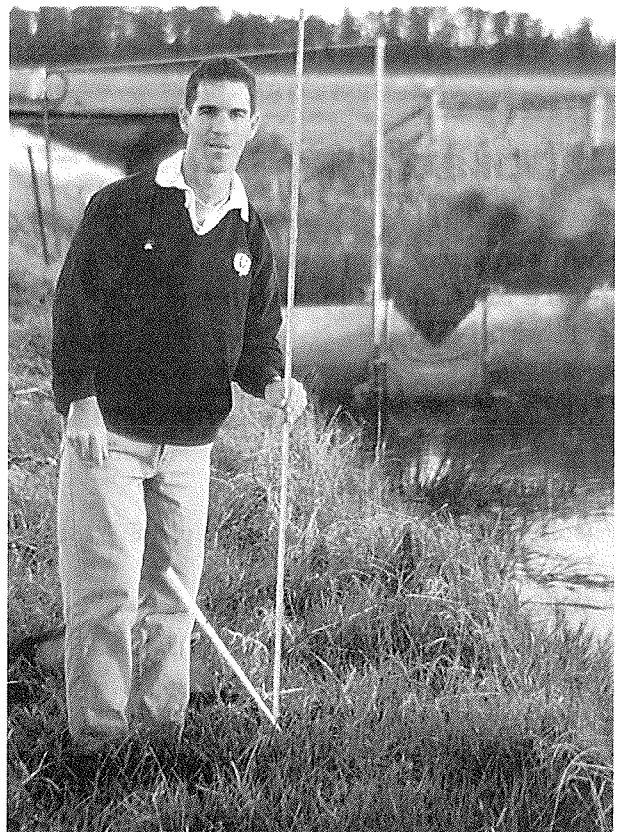
drains at the site recorded a pH of 2.1. A grid of piezometers is used to measure pH, electrical conductivity and watertable height at intervals of 10 days. The site also has a weather station to compare rainfall to watertables. The project is funded by Acid Soil Action with contributions from the University of Wollongong as well as Shoalhaven Council, federal and state government agencies.

For further information contact Bruce Blunden on 02 42213 046.

Excavator operator workshops

More than 24 South Coast excavator operators learnt how to identify ASS and how to conduct a field test during a workshop at Shoalhaven Council in Nowra during June. It is important that all excavator operators can identify ASS, know how to avoid disturbing them or else know how to treat any ASS drain spoil to prevent acid leachate.

Bruce Blunden, who wrote the Environment Protection Authority's Assessment Guidelines for ASS, and Roy Lawrie a soil scientist with NSW Ag used soil cores, slides and case studies to show the importance of preventing oxidation of ASS.



Bruce Blunden takes a reading from a piezometer as part of his PhD on ASS based on field trials at Berry south of Sydney. Note the "drop board" weir in the drain.

A similar workshop was held at Hexham, near Newcastle, with input from the Department of Land and Water Conservation Port Stephens Council and Jes Sammut from University of NSW.

The workshops were funded through Acid Soil Action. Other workshops were held earlier this year covering the Tweed, Richmond, Clarence catchments as well as at Port Macquarie area. Further workshops are planned for Kempsey and Wollongong. Meanwhile, Tubemakers have published a reference manual, Module WSF 1.06 (NSW Version 1.01) to help excavator operators and backhoe drivers understand on-the-job environmental impacts. The manual contains a summary of ASS and each participant in a Tubemakers training course is provided with the Introduction to ASS booklet. So far more than 500 operators have undertaken Tubemakers nationally recognised training program.

Drain weed clearing guidelines

A draft guideline for drain weed clearing has been compiled by the NSW ASS information officer. The guideline will help councils, government agen-

cies, landowners and excavator operators understand how to prevent acid leachate being generated during routine drain weed clearing operations. The guidelines include details on lime use, prototype reed buckets which minimise soil disturbance, a flow chart on regulations, plus how to treat iron monosulfide. Free copies of the guidelines are available by telephoning Jon Woodworth on 02 66261344, fax 0266 281744 or email woodwoj@agric.nsw.gov.au.

ASS survey of farmers' understanding

A total of more than 260 sugar cane, tea tree, dairy and beef farmers have participated in a telephone survey to gauge their understanding of ASS management issues on their properties. The survey is designed to benchmark community attitudes and management practices. It will also provide feedback for an ASS educational program currently being undertaken by NSW Agriculture with NHT funding.

Farmers were asked about management and awareness of ASS, drain water quality, environmental impacts of ASS on the property, and how they find out information about the issue. The results of the survey, which sampled selective catchments along the whole NSW coast, will be available in late July. Preliminary results show that the cane industry in the Tweed Valley had the greatest level of understanding and management activities while the grazing industry, due to poor commodity prices, could not afford to use lime for non-agronomic purposes.

For further information please telephone Alice Woodhead on 0266 261215.

Updated ASS maps

An updated series of acid sulfate soil risk maps covering NSW coastal areas has just been released by the Department Land and Water Conservation (DLWC).

DLWC's Greg Chapman said most of the map changes involved reducing the area defined as low risk in upper valley alluvial soils and changes to Pleistocene coastal sand areas. The 130 maps include colour coding of the depth and extent of acid sulfate soils on a 1-25,000 scale. "The maps will be a useful tool for councils, developers, farmers, and researchers who need detailed information about localised ASS," he said. A key part of the

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(i.e. using chromium reduction analysis & electron microscopy)

For further information contact:

Graham Lancaster
Tel: (02) 6620 3678 Fax: (02) 6620 3957
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NSW Strategic plan for ASS is to reduced disturbance of these environmentally sensitive soils and the maps will help achieve this by outlining where the sulfide materials are located. NSW has about 600,000 hectares of ASS which can oxidise to produce sulfuric acid when drained and exposed to air.

The map update project, which cost \$60,000, was commissioned by ASSMAC as part of the NSW Government's Acid Soil Action program, a \$2.1 million research, education and rehabilitation program over three years. The maps are also available on a digital geographical information system.

The ASS risk maps cost \$10 and are available from DLWC's Head Office on telephone 02 92286111.

ASSMAC TC view computer model

A Queensland ASS consultancy, Gilbert and Sutherland, has developed a computer program - Quicksurf for windows - which enables it to present a three-dimensional model of the spatial distribution of ASS at development sites.

Consultant, Neil Sutherland says the program enables a quick, accurate cost estimate of the amount of lime required to treat ASS. Members of NSW's ASSMAC Technical Committee recently inspected a proposed large-scale residential development, Cobaki Lakes Estate, in Tweed Shire. Neil Sutherland is undertaking an ASS management plan for the 600 hectare site which is just south of Coolangatta Airport.

Neil says that over several years a series of owners of the site had spent about \$5.3 million on ASS and geotechnical surveys as well as flora and fauna

studies. "But the new owner still didn't have a clear picture of how much it was going to cost to treat the ASS, or how he could minimise disturbance of ASS material through managing earth works. "We were able to model, using a soil survey based on vibro core sampling, which soil is suitable for overfill and where houses can be built," Neil said. For further information, please telephone Neil Sutherland on 55789944, fax 55789945 or email gsrobina@bigpond.com

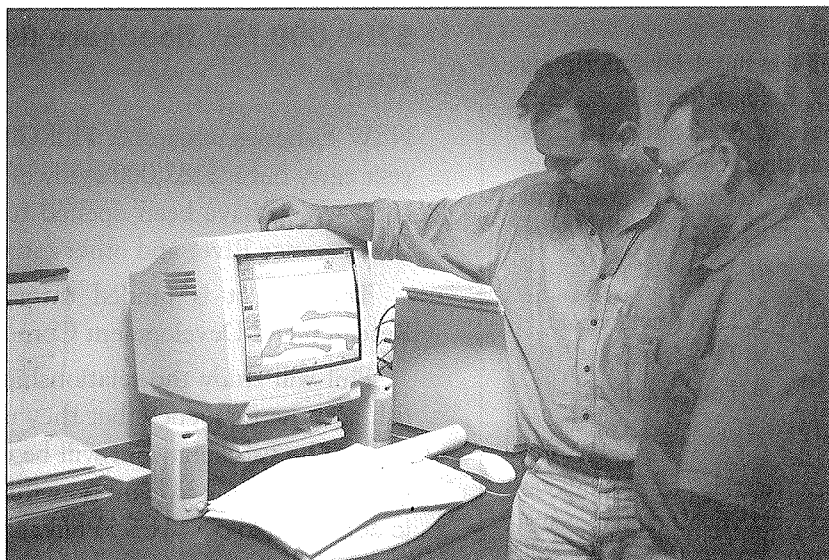
Electrode treatment of ASS slimes

Electrode dewatering is being trialed as a rehabilitation method on an ASS slimes stockpile at Chipping Norton on the Georges River in Sydney's south-west.

A slimes stockpile, produced over a 20 year period of topsoil "harvesting", has produced a 10 hectare artificial backswamp. A 2 hectare area contains 5-6 per cent sulfides at a depth of 10 metres. The Department of Land and Water Conservation is placing electrodes in the slimes and passing a direct electrical current through the soil. This process draws water to one of the electrodes where it is pumped out at pH 13.

The Technical Committee chairman of ASSMAC, Ian White has inspected the site and says that electrode dewatering is a very effective, but expensive ASS treatment. Geotech fabric will stabilise part of the site, while the rest will remain as wetlands.

For further information please contact Ian White on email ian.white@cres.anu.edu or tel 06 249 0660.



Ian White and Neil Sutherland inspect the computer model of ASS for Cobaki Lakes Estate.

WA Beenup Mine update

Ian White reports that 6-10 million tons of ASS material will be produced as part of one billion ton BHP Pty Ltd heavy minerals sand mining operation at Beenup, near Cape Leuwin in WA.

"The soil is 130 million years old and contains a mixture of clays and sands. As part of ASS treatment, BHP will attempt to separate much of the pyrite and place it back in a pond. This will be difficult however because the particles vary from 1 - 75 microns.

Groundwater at the site, (elevation AHD 23) flows towards a National Park which is within 100 metres of mining lease. The mine pond recently measured pH 4 but this is being raised to pH 5.5.

The mine operation measures about 1 km by 1km and is 60 m deep and the mining operation will last about 25 years.

"BHP faces another big challenge in managing the expansion factor of the soil." "After disturbance, 20 per cent of the mined material will rise above ground level potentially exposing large amounts of ASS to oxygen. "This is one of biggest sand mines in the world and the first time mineral sands are being dug in this type of soil profile," he said.



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For further information please contact Ian White on email: ian.white@cres.anu.edu

or BHP's Louise Parkinson on telephone 08 97582500.

Acidification and oysters on the Manning River

Mike Dove and Jes Sammut (UNSW) have recently recorded severe degradation of river and creek systems from acid sulfate soil discharges in NSW's Manning River catchment.

The water quality testing has expanded field experiment sites for a Fisheries Research and Development Corporation (FRDC) project and also sourced acid discharges affecting oyster leases. Local oyster farmer Ian Crisp helped monitor harmful pH levels in Dickensons Creek, Ghinni Ghinni Creek, Cattai Creek and large reaches of the Lansdowne River. The affected reaches showed evidence of recurrent acid discharges and were devoid of aquatic life except for acid-tolerant waterplants and algae. The floodplain has been extensively drained in the past and drain water pH indicates severe acid sulfate soil leachate. A recent ABC television 7:30 Report showed that aluminium-laden slugs of acidified water are affecting Cattai Creek to its junction with the main channel. Reduced oyster productivity in the area is reputedly linked with these acid discharges and will be experimentally studied under the FRDC project.

For more information please telephone Mike Dove on 02 6582 2721, or email: mike.d@fel-glow.com.au or Jes Sammut on 02 9385 6211, or j.sammut@unsw.edu.au.

\$200,000 for floodgate fish passage study

NSW Fisheries researcher Phil Gibbs will later this year carry out a \$182,000 study of fish use of floodgates which have been opened to tidal inflows on the Clarence River and other estuaries.

The project is funded through the Fisheries Research and Development Corporation.

Phil will study the relationship between size of fish and the frequency that they use opened floodgates. The fish behaviour will be captured on infra red video. "I hope to learn how the low level chronic acidity (pH 5 - pH 5.5) affects mature bass and fingerlings and if given a choice, bass will enter

acidic drain water". For further information, please telephone Phil Gibbs on 02 95278411 or email Gibbsp@fisheries.nsw.gov.au.

Clarence River Research Projects

Clarence River County Council (CRCC) recently presented representatives of Federal research and development corporations with an overview of the Clarence Floodplain Project (CFP).

The Grafton based CRCC has responsibility for floodplain management within the boundaries of Nymboida, Copmanhurst, Grafton, Ulmarra and Maclean councils. It manages hundreds of kilometres of public drains and hopes to improve water quality during non flood times through control of floodgates. The integrated project involves more than a dozen projects. Some of these include an audit of all floodgates and habitats, water quality assessments, fish passage studies, development of better drain clearing methods, and the impact of in-drain tidal waters on pasture and sugar cane. For a detailed summary of the CFP projects please contact Alan Cibilic at CRCC's on 02 66423277 or email crcc@nor.com.au; or contact ASSAY editor Jon Woodworth on 02 66261 344.

Floodgates open 40 kms of drains to tides

The Minister for Fisheries, Bob Martin, this month officially launched a project which will see the return of tidal influence to 40 km of large drains on the upper Tweed River.

Mr Martin said that the opening of floodgates would encourage fish passage and that salt water would help buffer acid water which was flowing into the drains after floods. The floodgates at Dulguigan, and at Condong Creek on the Tweed River will be partially opened following \$6,000 worth of works by DLWC and Tweed Shire Council's Tweed River Management Plan Advisory Committee. A further \$33,000 will be spent on three monitors to gauge

salinity, pH, dissolved oxygen, and water height. The information will be sent via radio frequency to council's flood computer.

If salinity levels rise, or if flash floods occur, the gates will be closed to protect cane production. More than 100 landowners are involved in the project and they have full control over opening and closing of the gates. Richmond Tweed Local Action Committee Chairperson, Robert Quirk, reported on the project at the recent annual general meeting of NSW Canegrowers Association. Chairman of NSW Canegrowers, Graham Martin urged other cane growers to consider similar trials on the Clarence and Richmond Rivers.

Environmental book covers ASS

NSW Fisheries' Craig Copeland has edited a book "Saving our Natural Heritage" which looks at the role of science in managing Australia's ecosystems.

Craig is a member of the NSW Acid Sulfate Soils Management Advisory Committee

and his book includes a chapter on the latest scientific research into ASS.

The ASS chapter was co-authored by Ian White (ANU); Mike Melville, Jes Sammut, Chuxia Lin, Pam Van Oploo, (University of NSW); and Ben Wilson and Xihua Yang (Charles Sturt University).

It reviews current environmental issues and suggests some fresh approaches to the economic and political issues of rehabilitation and management. Duncan Leadbitter, (National Fishing Industry Council) and Mike Read from Read, Sturgess and Associates wrote a chapter on the value of wetland habitat restoration.

Craig says that the community relies heavily on science to help it protect the environment and that scientists need to be able to work in teams, and use the media, to present information in an interesting unbiased way. The book was initiated by the Kooragang Wetland Rehabilitation Project, near Newcastle.

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Ban on offshore ASS sediment dumping

Major Australian ports will soon have to find alternative uses for dredge material due to changes in Federal Government regulations on dumping at sea.

In the Brisbane River alone, more than a million cubic metres of sediment, much of it containing pyrite material, is dredged each year to keep navigation channels open. Queensland's Griffith University lecturer Paul Saffigna says that some of the material could be turned into topsoil using a hydroslicing technique developed at the Neumanns Pty Ltd Chinderah bypass project on the Tweed River.

He is currently developing a Port of Brisbane Corporation Plan of Management for the dredge spoil, including an option to sell material as topsoil once it is incorporated with sand and treated to remove pyrite.

"In the past the dredged material was used to reclaim land around harbours but there is a limit as to how much can be used for this and alternative uses are needed."

"The dredged material can contain heavy metals, especially near large cities, and the Federal Government is keen to stop offshore dumping of spoil from all major Australian ports," Paul said

For further information please telephone Paul on 07 387 571111 or email: paul.saffigna@plato.ens.gu.edu.au.

Healthy River Commission hearings

The Healthy Rivers Commission (HRC) has completed its public hearings for the Clarence and Shoalhaven Rivers as part of the NSW Water Reform.

A discussion paper on the Clarence River has been released and a draft report on submissions is due in August. A final round of submissions will be accepted on the draft before it is presented to the NSW Parliament. ASSMAC has made a submission to the HRC on Clarence and general ASS issues..

Officers from HRC attended a recent workshop on ASS at Grafton and say councils identified ASS

as one of the main issues for the Clarence.

For further information, telephone the HRC on 02 92312977.

Estuary management committees

An ASS remediation workshop in Sydney in April discussed the possible role of Estuary Management Committees (EMC) in coordinating local activities to fix ASS problems.

ASSMAC chairman, John Williams said that EMC's were suited to coordinating local community rehabilitation of degraded ASS areas. Estuary Management Committees are an important part of local government on the NSW coast. "To enable ASS remediation to be addressed strategically the issue needs to have a "home" and EMC's when resourced appropriately could be an ideal structure to deal with ASS," he said.

Yolande Stone from Department of Urban Affairs and Planning said that where ASS had been successfully managed on a catchment level it required the following "essential ingredients" "Firstly you need an established local organisation, as well as scientific data and an injection of funds," she said.

The workshop examined the following case studies: Jes Sammut (UNSW) and John Williams on the Tuckean Swamp; John Murtagh (consultant for Oceania Pty Ltd) on a tea tree plantation at Port Macquarie; Russel Yerbury (farmer) on ponded pasture at Clybucca, Allan Murphy (consultant) from Shoalhaven Starches on a pasture treatment at Berry, Phil March (NSW Fishing Council) on the Yarrahappini and farmer Robert Quirk on sugar cane water table management. More than 40 participants attended, including state agencies, consultants and the chairman of the NSW Coastal Committee, Bruce Thom as well as a representative of the Premiers Department.

For further information, please telephone Yolande Stone on 02 93912000.

Bushfire plans of management

The NSW Bushfire Service is fighting a large peat fire in a drained wetland at Tyagarah near Byron Bay. The 120 hectare fire contains a section of SEPP 14 wetland and has been burning for two months following this year's extended dry season. Despite one million litres of water being pumped onto site daily, and 10 cm of rain falling in a single

day, it kept burning. Local bushfire controller, Noel Blizzard says that the peat layer is up to 4 m deep in places. He plans to hire a large pump to use water from the nearby Byron sewage plant to treat the fire which was lit accidentally. Smoke has been causing asthma and bronchial problems in nearby towns. ASSMAC recently requested the NSW Rural Fire Services to address the ASS environmental problem of peat fires which often leave bare areas which can become acid scalds due to lack of organic matter needed for plant growth.

The Rural Fire Service is currently developing a series of regional fire plans of management for NSW coastal regions and will incorporate ASS management in the plans. For further information contact ASSAY editor, Jon Woodworth on 0266 261344.

Cane conference at Ballina

More than 650 delegates attended the Australian Society of Sugar Cane Technologists conference at Ballina recently. A poster on the NSW cane industry's ASS project was presented by Peter Neilsen (Broadwater Mill) and Fraser Chapman (Harwood Mill).

ASSMAC chairperson, and North Coast Regional Director of Agriculture John Williams, opened the conference. Peter Neilsen reports that the ASS farm sampling project has surveyed 55 per cent of NSW's 700 cane farms. "The cane farmers have observed the results of field tests on soil cores to 1.5 metre depths on their farms and now know if ASS are present, and at what depth," he said.

The soils laboratory at Broadwater Sugar Mill, despite some equipment problems at the start of the project, is now keeping pace with the field sampling. The laboratory work is coordinated by Masters student, Balakrishan who is employed by the CRC for Sustainable Sugar Production. The sugar industry has a requirement that all new cane lands are assessed for acid hazard before issuing contracts for milling cane. The industry has included a condition in its five-year contract with all cane growers that they adopt a best practise ASS code.

"The sampling project, and recent workshops for excavator operators who clear weeds from cane drains, have paid off as growers are now trying to prevent ASS disturbance or are using liming strategies," Mr Neilsen said. Jullian Colins, the environmental technician who undertook field sampling,

has accepted a position as an extension officer with BESE in QLD and his replacement, Tim Shapter, is now doing the soil samples.

For further information telephone Peter Neilsen on 02 6620 8257 or fax 02 6682 8330.

Investment tea tree takes the high ground

Queensland tea tree consultant, Sid Dyer says that site selection for new plantations is favouring higher elevation sites rather than traditional low, swampy ASS areas.

He says that higher elevation soils do not require deep drains to be dug and can be laser graded or laser levelled which allows control of "water on and water off." "Another benefit is quicker access to plantations after heavy rain and less soil compaction by machinery," he said. "If Australia's climate swings back to a wet cycle for the next several years of very wet seasons then the laser levelled plantations will still be able to harvest," he said.

Sid has just finished a contract for a 50 hectare tea tree plantation at Tatham north of Casino on dark brown to chocolate soil treated at a rate of four tonnes of lime and four tonnes of gypsum per hectare. "People are now investing commercially in tea tree and industry requires better plant husbandry to maximise nutrient availability and produce improved yields," he said. "If you are spending upwards of \$5,000 per hectare on seedlings then it makes sense to spend \$600 to \$700 per hectare on laser grading to provide a good foundation for the plants and to protect your soil condition which is your fundamental asset," he said. Selecting higher ground will also prevent disturbance of ASS.

"Tea tree can cope with acidic or salty soil conditions, but can die under these conditions after harvest. "The plant can also deal with flooding, however prolonged flooding, especially during hot conditions on uneven paddocks can 'cook' the roots and kill trees," he said.

* NSW Agriculture officers, Abbey Jenkins and Bede Clarke recently conducted a field day for tea tree growers at Kempsey. The ASS project officer for Kempsey, Scott Henderson, and ASSAY editor Jon Woodworth addressed ASS issues as part of the presentation.

For further information Sid Dyer on tel 07 55332026 or email sdyer@ausinfo.com.au.

National Soils Conference

The Shadow Minister for the Environment, Duncan Kerr MP officially opened the national soils conference on the environmental benefits of soil management in Brisbane in April.

The three day conference was organised by the Australian Society of Soil Science and included three papers on ASS. Professor Ian White reviewed the Australian achievements in the field of ASS hydrology, chemistry, agronomy biology, physics as well as social and economic dimensions.

The 550 page conference proceedings include a wide range of papers. The ASS content includes: Acid volatile sulfur distribution in two acid sulfate soils and some management implications -Richard. T. Bush and Leigh A. Sullivan; Use of Peepers to Sample pore waters in ASS- P.Van Oploo, I. White, M.D. Melville, P.W. Ford; How important is shell particle size in determining potential acidity of ASS - Sharon Denny and Dennis Baker; Remediation of saline acid sulfate sediments dredged from the Port of Brisbane - P.G. Saffigna, T.J. Blumfield, D. Wiseman, and N.J. Mathers; and ASS and habitat modification for mosquito control at Noosa, Qld - K.M. Hey and P.G. Saffigna.

ASS diary

June 26

ASSMAC Technical Committee Meeting - Sydney

July 3

ASSMAC meeting Sydney

July 15 -17 1998

National Soil Acidification Conference -
Sunshine Coast tel 02 6257 3299 or
fax 02 6257 3256.

(Land and Water Resources Research and
Development Corporation Qld

Natural Resources Department and Dept of
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August 5

Essential Oil Tea Tree Symposium,
Wollongbar Agricultural Institute.

Contact Garry Baker on 02 66261104.

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Editor: Jon Woodworth
ASS information officer

Address: C/o Assay Editor
NSW Agriculture
WOLLONGBAR NSW 2447

Phone: 02 66261 344

Fax: 02 66281 744

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