



# ASSAY

A NEWSLETTER ABOUT ACID SULPHATE SOILS

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## First national conference on ASS

More than 180 delegates attended the first national conference on acid sulphate soils in June.

It is obvious there are no easy solutions to the problems acid sulphate soils pose. But conference delegates concluded that, generally, problems can be minimised or avoided by limiting drainage of coastal lowlands.

Delegates agreed that future management requires increased community awareness and guidelines for landowners rather than heavy handed legislation.

Delegates comments were in the main enthusiastic, asking for co-ordinated research and management guidelines as well as a followup conference in a few years.

NSW Agriculture will continue to produce ASSAY to keep you up to date with news.



National Conference field tour: Keynote speaker David Dent (right) and delegate Paul Hopkins (centre) watch as Mike Melville, University of NSW, demonstrates the plastic nature of potential acid sulphate clay. This soil is about 70% water and is very soft.

## Seagrass affected

An 82% decline in seagrass beds over the past decade at Trinity Inlet, near Cairns, has coincided with drainage of a large area of former mangrove swamp to grow sugarcane. This decline in seagrass is documented in the EIS for the Royal Reef Development.

Drainage in the mid seventies has resulted in severe acid sulphate soils which Dr Dent inspected in July before returning to England.

Scientists previously attributed the sea grass decline to increased turbidity. However, the impact of high levels of aluminium and iron in acid sulphate runoff should be investigated, according to Dr Dent.

## Acid sulphate gravel

A NSW Road Traffic Authority (RTA) stockpile of river gravel recently produced drainage water of pH2.7 killing fish in a nearby dam. Analysis found that mud clods in the stockpiles were the source of the pyrite, about 13 tonnes in the 15,000 cubic metres of gravel.

RTA solved the potential problem by initially constructing bunds to contain and neutralise the runoff, and then mixing extra lime into the road base material to counter acid formed from further oxidation.

The gravel is normally mixed in a pug mill to a 3:1 ratio with granite fines. Included is a 4% stabiliser containing 15% lime and 85% slag. The RTA increased the lime to 20% and used the gravel as road base.

The lesson learnt by the RTA is that any sand or gravel extracted below the tidal limit and lower than 5 metres above sea level has the potential to contain pyrite. As a result, the RTA has come up with some management recommendations: Any dark organic mud dredged should be examined on the spot. If identified before it has oxidised it can be returned safely to the river. If it has started to oxidise, calculate the potential oxidisable acid-

ity and mix in lime at a rate to neutralise the acid hazard. If the gravel is to be used for road base or construction, mix in the lime or magnesite and use as soon as possible.

## Farming ASS

Australia has some of the worst acid sulphate soils in the world. But they can still be farmed according to Dr David Dent.

He says people in other countries successfully farm acid sulphate soils for rice, oil palm, sugarcane and fish/shrimps. Their farming depends on keeping soil and groundwater disturbance to a minimum.

They prevent the pyrite oxidising by not digging it up and exposing it to air, and by keeping the watertable as high as practicable.

Crops are grown on raised beds formed with soil dug from broad shallow drains which do not expose underlying pyritic soil. The raised beds enable acids and salts to leach from the soil into the drains.

While farming is possible, yields on acid sulphate soils seldom reach those achieved on better soils. On the Mekong Delta, almost 75% of farms have been abandoned due to low productivity. The farmers cannot afford lime to improve the yields.

The main lesson for Australian farmers is that it is easier and cheaper to avoid creating acid sulphate soils than to treat them. Prevention is definitely better than the cure.

## Satellite mapping easy

Mapping acid sulphate soils by satellite is cheaper and faster than traditional techniques according to John Hindle, NSW Agricultural Environment Officer, Nowra.

Plant communities known to grow on acid sulphate soils have recently been mapped from satellite images on the NSW mid-north coast, near Kempsey.

John Hindle carried out several site inspections to relate the plant communities to the reflectance values detected by the satellite.

He says quantifying the total area of acid sulphate soil from satellite images is easy because the reflectance values are stored on computer.

So far, site inspections have agreed closely with satellite predicted distribution of acid sulphate soil.

Editor - Richard Bush



National conference field tour:

Tweed canegrower Robert Hawken explains that crop yields on acid sulphate peats can be very high but acid water draining from these soils is a problem. CSIRO/University of NSW scientists are using his farm to look at ways to limit acid water drainage.

At the conference, organisations were asked to list their current or planned programs for the management of acid sulphate soils. The programs are listed below.

- **Local/State government:** improve guidelines for environmental impact assessment.
- **Farm organisations:** consider alternative management systems to reduce acid drainage.
- **CSIRO/Universities:** research ASS and management.
- **Fisheries:** monitor waterways, identify affected areas and community education.
- **NSW Agriculture:** maintain links between all groups with ASSAY and provide information to farmers.
- **CaLM :** map acid sulphate soils.
- **NSW Water Resources:** protect water quality from acid sulphate soil drainage.
- **NSW Environment Protection Authority:** limit water pollution by providing guidelines for developers.