

A new partnership with Botanic Gardens and Parks Authority (formerly Kings Park & Botanic Gardens) resulted in two popular courses run in February, to start the new year.

Restoration with Native Plant Species attracted people from landcare, local government, and both mining and private companies, with the added bonus of views over the city during lunch. Combining theory and practice, lectures were held in the morning, then tours and laboratory sessions followed in the afternoons. Smoking seeds to enhance germination, tissue culture, breaking seed dormancy and tours of the nursery and seed storage facility made for interesting days.



Demonstrating the vacuum seed sowing machine in the nursery at King's Park.

Managing Remnant Vegetation afforded a general overview of issues such as Dieback, Weeds, Pests and Diseases and Covenanting to protect your property.

Soil Biological Fertility Workshop

An intensive 2-day workshop on soil fertility from a biological perspective was held at the University of Western Australia during February. The course was organised into 4 major sections: (i) Components of the soil biota and their role in soils (Dr Graham Osler), (ii) Microbial processes – organic matter and nutrient cycling (Dr Daniel Murphy), (iii) Microbial-

root interactions and their impact on soil fertility (Assoc. Prof. Lyn Abbott), and (iv) How does soil biology influence the physical properties of soils? (Dr Bradley Degens). Each section consisted of a series of morning lectures and afternoon practical sessions. The 30 participants were able to use their own soil to collect and identify soil animals, measure microbial activity, fractionate soil organic matter into active and inert components, extract hyphae and assess soil aggregation. Other practical sessions, including work on mycorrhizal fungi and rhizobia, used pre-prepared materials. Interactive computer programs and models were also used to aid with demonstrating specific topics.

The aim of the workshop was to provide a fundamental understanding of soil biological fertility. Participants were from a diverse background including agricultural extension workers, consultants, compost companies, informed farmers and landcare advisors. The diversity in prior knowledge was a challenge for the organisers but all participants seemed to enjoy the course and we received positive feedback. Due to the limited places available for this course it will be run again on 3-4 July 2000. For more information please contact course co-ordinator Dr Daniel Murphy (08 9380 7083).



Dr Daniel Murphy teaching in the lab.

PROPOSED COURSES FOR 2000:

“Minewaste Management for the Tropics”

14th-16th June Darwin NT
Cost: \$960 including all materials and laboratory work. Attendees may bring their own samples for analysis. Presented in collaboration with the NT Dept. of Mines & Energy. Speakers from UWA include Prof. Bob Gilkes and Dr David Jasper as well as a range of professionals and experts from the NT. Early-bird registration by 7th May is \$850.

“Wetlands Management”

12th July UWA
A look at urban wetlands, impacts, policies for management and proposed treatments. Local case studies will be described.
Cost: \$150

“Environmental Monitoring in Mining”

September UWA
This two day course, presented by industry consultants and UWA researchers, will give an overview of the many areas covered in monitoring minesites-flora, fauna, noise, air, and water quality.
Cost: \$450

“Compost in Horticulture”

October UWA
A follow up from the successful seminar held last year, in conjunction with AgWest. Current developments in research affecting horticultural yields will be presented and growers will share their experiences.

“Chemistry of Contaminated Land”

28th-29th November UWA
An intensive two days, covering the chemistry of contaminated land. This is intended as a lead-in to the **Remade Lands 2000** International conference to be held at Murdoch, 30th November-1st December. Details of that event can be obtained from: Dr Kuruvilla Mathew Phone: 08 9360 2896 Email: mathew@essun1.murdoch.edu.au

“All about Native Seeds”

A look at their formation, collection and the relevance of provenance, storage, biology and quality-germination & viability.

If you would like to be on our email database and receive notices about forthcoming courses, or require any further information on the above, please contact **Sandra Maynard**, Training & Extension Officer on 0893803827 Email: sandra.maynard@uwa.edu.au

Website: www.clr.uwa.edu.au

CONFERENCE

The Goldfields Land Rehabilitation Group will be holding its 2000 Workshop from 24th-26th May in Kalgoorlie. The theme is Environmental Standards for the New Millennium, with particular reference to Arid and Semi-Arid areas. For programme and registration details, please contact Jim Tucker Phone: 08 9024 8809 Email: jimt@awi.com.au

RESEARCH NEWS

A Native Solution For Rehabilitation of Saline Soils On Minesites : *Halosarcia pergranulata*

by Vicki McAllister and Alan Hill

Confronted with the problem of rehabilitating salt affected areas caused by some mining operations in the Eastern Goldfields, Dr. Tim Colmer and Digby Short from UWA's Plant Sciences Group looked at nature's solution to saline conditions and adapted it to meet the problem. *Halosarcia pergranulata*, a native salt tolerant shrub, was observed growing on the margins of salt lakes around Kalgoorlie. Could this plant be used for rehabilitation of saline areas? Mining operations in the Eastern Goldfields can result in saline surfaces from exposure of salt-affected sub-soils or bringing saline water to the surface when dewatering mining shafts or open cut pits. In addition, operators often use the extremely saline ground water in ore processing and dust

abatement. However, mining companies are required to re-establish plants at these sites to prevent wind and water erosion. This presents a formidable challenge. Not only is it necessary to find species that have a high tolerance of salinity to allow the plants to survive and reproduce, but the chosen species will have to withstand the extreme weather conditions of the region while not becoming an invasive weed.



Working at Lake Hannan

Initial attempts at rehabilitation by some mining companies showed the potential of the species, *Halosarcia*. However, there is almost no information on the ecology and physiology of the numerous species in this genus and certainly not enough to develop re-vegetation strategies with any confidence. Dr Tim Colmer and Digby Short, researchers at the University of Western Australia set out to investigate possible solutions as part of their research program into the use of native halophytes (or salt-tolerant species) for mining and agricultural applications. As an example of the promising possibilities that are emerging they cite *Halosarcia pergranulata*, a native halophyte, which occurs widely on salt lakes throughout Western Australia.

They measured the response of *Halosarcia pergranulata* to salinity treatments in the glasshouse and found that the plant grew best at salt levels as high as three quarters of that in seawater. *Halosarcia pergranulata* even grew at salt levels one and a half times greater than seawater. While growth at this extreme salinity was

slow, this level of salinity would be more than enough to kill most of the other species currently being used for rehabilitation. When commenting on the results Mr Short said “if we use *Halosarcia* species we will be able to mimic the natural plant communities of the saline areas of this region, and this allows a degree of authenticity in our rehabilitation work on mining sites that is very desirable”.

Halosarcia pergranulata offers many benefits if included in a revegetation program. It may lack the high water use and palatability of many of the other species that are currently used like the more common saltbush or *Atriplex* species but it is more than a match for them with its high tolerance to salinity. This makes *Halosarcia pergranulata* a prime candidate for many areas considered too badly salt affected for rehabilitation. Digby Short concludes, “This is just one encouraging result from the research that we are conducting into the potential for native halophytes. The genus *Halosarcia* is poorly studied and potentially new species (and sub-species) are still being discovered. It makes us confident that there will be others that we can use successfully for particular applications in the future.”

Short, DC & Colmer, TD. (1999). Salt tolerance in the halophyte *Halosarcia pergranulata* subsp. *pergranulata*. *Annals of Botany* **83**:207-213.

For further information contact Dr Tim Colmer, Faculty of Agriculture, University of Western Australia, 6907. Ph 9380 1993.

A world-wide discussion group on salt lakes can be found at: www.topica.com

The CLR is sponsored by:

