



### New Erosion Research Capabilities at CLR

Research capabilities for erosion assessment are now available with a new Rainfall Simulator at the Centre for Land Rehabilitation through the UWA Soil Physics research group lead by Dr Christoph Hinz. The simulator is able to reproduce natural rainfall events of differing intensity and duration, allowing realistic assessment of erodability, infiltration and runoff. Landform stability as determined through erosion assessment is essential for the planning of current and future landform designs for rehabilitation

The erosion of soils by water is a significant problem in both agricultural and mining situations. In mine site rehabilitation, the development of landform designs and strategies that facilitate landform stability is a key factor of rehabilitation success. Many of the waste materials from mining operations, once deposited at the surface, have intrinsic properties, such as high sodicity, that make them susceptible to water erosion. This often makes their management and incorporation into rehabilitation designs very difficult.

Water erosion occurs when rainfall is greater than the rate of infiltration creating runoff. If the energy of the moving water exceeds the forces that bind soil particles together, soil particles detach and move with the water.



The loss of soil and nutrients can have detrimental effects both on and off site. Factors affecting runoff and water erosion include the intensity, duration and frequency of rainfall events (erosivity), vegetation, surface roughness, soil properties (erodability), slope angle and slope length.

Assessing erosion potential requires accurate measurements of infiltration, runoff and soil loss. While erosion potential is often assessed indirectly by measuring simple soil physical properties, accurate measurements of erosion can only be made with a Rainfall Simulator.

Erosion assessment with the rainfall simulator will be available from June 2002.

For more information, contact:  
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### PROFILES

The CLR has many overseas students involved in study & research and presents occasional profiles, for your i n t e r e s t .

Bingah Astuti Hardiputra -  
Postgraduate Student

Bingah Astuti Hardiputra has joined the Soil Science group at UWA directly from PT Kaltim Prima Coal (KPC), the biggest coal mining company in Indonesia, where she worked since 1993 as a Civil and Rehabilitation Engineer. Bingah graduated from Water Resources Engineering at Brawijaya University in East Java, Indonesia in October 1992. The major component of her studies was hydrology, irrigation and drainage structures, and dam construction. At KPC, Bingah managed contractors involved in rehabilitation projects and was also involved in strategies to minimise acid mine drainage.

Bingah has accepted a scholarship from AusAID to study for her Masters degree in Soil Science for two years. She hopes to focus on soil development under reconstructed soil profiles and relate it to rehabilitation performance. The enhanced soil science skills that Bingah will acquire will allow her to further enhance rehabilitation outcomes at KPC, on her return.

## CENTRE FOR LAND REHABILITATION

Anne Nurbaity came to UWA from Padjadjaran University, Bandung, Indonesia, where she was a Junior Lecturer in the Soil Science Department, in the Faculty of Agriculture. Anne has a Bachelor (1995) and Master (2000) degree in Agricultural Science, majoring in soil biology. Her main research area is soil biology, particularly bioremediation and land degradation.

In her research with the CLR, Anne will be investigating the impact of dryland salinity on mycorrhizal fungi. Anne's research will be supervised by Associate Professor Lyn Abbott. This research will strengthen Anne's skills in ameliorating land degradation, which is a most serious problem in Indonesia. Revegetation programs for degraded lands, e.g. after gold/copper mining has now become a major attention of the Indonesian government.

In research for her Masters degree, Anne investigated growth of plants in tailings obtained from mining operations at PT. Freeport Indonesia. In particular, she examined the effects of mycorrhizal fungi and organic matter on heavy metal (Cu) concentration, NPK uptake, and biomass of upland rice. This collaborative research was supported by PT. Freeport Indonesia, and was conducted with the Mycorrhizal Laboratory, Biotechnology Inter-University Centre at the Bogor Agricultural Institute.

### NEW STAFF

Faron Mengler has taken up a 3 year position with the CLR as Research Officer. He is investigating and

developing optimum ripping practices at Alcoa's bauxite mines near Dwellingup, WA.

At present, post-mining ripping is applied broadscale over Alcoa's mine floors to alleviate the compaction caused by heavy mining vehicles. Ripping improves the structure of the soil matrix, enabling root penetration and plant growth.

Bauxite mining removes the upper parts of the regolith profile, exposing a substrate of variable and often complexly distributed regolith materials. Some of these materials can be inhospitable to plant growth while some show little response to current ripping techniques.

Faron will be working with a PhD student to:

- \* explore the nature of the mine floor regolith
- \* evaluate ripping performance for different regolith materials and practices
- \* design and develop improved ripping methodology
- \* create a systematic framework for planning ripping operations for mines with complex distributions of regolith materials.

The project is funded jointly by ARC linkage and Alcoa World Alumina Australia Limited.

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### PROFESSIONAL COURSES Essential Oils & Medicinal Herbs

Carabooda 15th, 16th May  
Greenough 18th & 19th May  
Two days of sensory input and information on oils, herbs, composting & organic agriculture.

Highlights of these two days will be field demonstrations using steam distillation of assorted herbs & native plants



Jeff Allen, from Beechworth Aromatherapy in Victoria, manufactures his own stills, from the test size to the commercial. He will also talk on oil quality, analysis, clone selections and standards for lavender oil. Anyone who has a small property or intends to grow plants for oils or flowers, will find these interesting.

Andrew Pengelly, from Sydney, will talk about the medicinal properties of major herbs and some native plants. Andrew is on the executive of the National Herbalists Association of Australia and has written *Constituents of Medicinal Plants*. He is also editor of Australian Wild Herb Bulletin.

Cost: \$300 (incl GST)

For any further information please contact Training & Extension Officer, Sandra Maynard  
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