# Rainfall Simulation and Overland Flow Studies

Simulated rain is used to:

- Study the properties of a particular material;
- Observe the impacts of a particular management practice; and
- Increase the understanding of a particular process of infiltration, runoff or erosion.

By delivering rainfall when and where it is required, and under the specific conditions of interest, it provides accurate and cost-effective information in a fraction of the time required for studies that rely on natural rainfall. For our clients, this is a critical factor in many of the sites to be assessed by Landloch. It also provides enormous flexibility and capacity for Landloch studies.

Rainfall simulation is a mature methodology, with an established history in the development of both its equipment and experimental concepts. Dr Rob Loch, Landloch's Principal Consultant, has been involved in ongoing rainfall simulation research since 1975 and has published extensively in refereed journals. Landloch remains in contact with leading international research teams and is able to offer world's best practice in this specialty, which ensures competence in its application for clients.

The use of rainfall simulators and of associated overland flows is a key component of our specialised services when assessing interactions between climate, materials, vegetation and land use practises. A vast variety of conditions and materials can be tested, particularly when simulation of overland flows is linked with simulated rain.

Landloch's use of simulators and overland flows includes:

- Field and laboratory characterisation of infiltration and erosion characteristics in a wide range of mined wastes, process wastes (e.g. tails, fly ash) and soils around Australia and internationally;
- Studies of infiltration characteristics of natural sites for use in hydrology studies;
- Derivation of sediment characteristics, including sediment particle size, used in designing erosion and sediment control features;
- Investigation of the impact of material mixing on erosion potential;
- Studies of sediment, nutrient and pollutant movement from forestry and manufacturing sites;
- Studies of impacts of tillage management on compaction and infiltration in agriculture;
- Assessing development of compaction in horticultural plantations;
- Measuring the impacts of revegetation, consolidation and armouring on soil physical properties and erodibility; and
- Testing the effectiveness of a range of surface stabilisation products including hydromulches, polymers and turf.

Important features of the simulator used by Landloch include:

- A high spatial uniformity of rainfall;
- The rainfall kinetic energy rate ≈ 29 J/m$^2$/mm, which is similar to natural rain at intensities > 40 mm/h;
- An accurate control of rainfall intensity;
- A modular design to enable a range of plot sizes; and
- It's light weight and portable.

Landloch regularly plans, executes, interprets and provides reports as an integral component of our studies using rainfall simulation and overland flows.