

Rainfall simulation in education

Piet Peters, Jantiene Baartman, Harm Gooren, and Saskia Keesstra

Wageningen University, Soil Physics and Land Management, Wageningen, Netherlands (piet.peters@wur.nl)

Rainfall simulation has become an important method for the assessment of soil erosion and soil hydrological processes. For students, rainfall simulation offers an year-round, attractive and active way of experiencing water erosion, while not being dependent on (outdoors) weather conditions. Moreover, using rainfall simulation devices, they can play around with different conditions, including rainfall duration, intensity, soil type, soil cover, soil and water conservation measures, etc. and evaluate their effect on erosion and sediment transport. Rainfall simulators differ in design and scale. At Wageningen University, both BSc and MSc student of the curriculum 'International Land and Water Management' work with different types of rainfall simulation devices in three courses:

- A mini rainfall simulator (0.0625m²) is used in the BSc level course 'Introduction to Land Degradation and Remediation'. Groups of students take the mini rainfall simulator with them to a nearby field location and test it for different soil types, varying from clay to more sandy, slope angles and vegetation or litter cover. The groups decide among themselves which factors they want to test and they compare their results and discuss advantage and disadvantage of the mini-rainfall simulator.
- A medium sized rainfall simulator (0.238 m²) is used in the MSc level course 'Sustainable Land and Water Management', which is a field practical in Eastern Spain. In this course, a group of students has to develop their own research project and design their field measurement campaign using the transportable rainfall simulator.
- Wageningen University has its own large rainfall simulation laboratory, in which a 15 m² rainfall simulation facility is available for research. In the BSc level course 'Land and Water Engineering' Student groups will build slopes in the rainfall simulator in specially prepared containers. Aim is to experience the behaviour of different soil types or slope angles when (heavy) rain occurs. The MSc level course 'Fundamentals of Land Management' students carry out a hands-on practical in which they compare soil type and design and evaluate the effect of soil and water conservation measures. Also, MSc thesis research is being carried out using this facility. For instance, the distribution and movement of pesticide Glyphosate with sediment transportation was being quantified using the rainfall simulation facility.