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## New opportunity of RS - variable rainfall simulator for plots variable plots area

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Rainfall simulators are devices commonly used to study soil erosion in field and laboratory conditions. There is still an effort to develop equipment that will: not require a large number of workers, be easy to manipulate, have simple control systems, and automatically record data and parameters.

This paper shows a new variable rainfall simulator with many possibilities, it consists of four independent sections that can be joined into larger simulator. Each section can simulate rain on a 2x4m area. The rain is generated by swinging and pulse mechanisms. Soil sensors and rain gauges are integrated into the control unit.

The whole device is placed on a trailer that is moveable by car. On the trailer, there is also a 1m<sup>3</sup> water reservoir, control unit based on WAGO control unit with electric switchboard, water pump, hydraulic system and valves. The device could be controlled by any laptop or smartphone with a wifi connection.

Each section (4 total) consists of a boom with 3 nozzles connected to a stepper motor for swinging. Each nozzle has a valve to interrupt the water supply to the nozzle. These sections can be connected linearly to increase the length of the rainfall area (to maximum 16 meters), or they can be used parallelly, thereby performing multiple replications at one time on multiple areas side by side. All these sections are computer-controlled and are independent of each other. Each section contains sensors for measuring soil moisture and tipping bucket rain gauges for continuous monitoring of actual soil properties and control of the rainfall. Remote control also allows for variable rainfall scenarios. The device allows the use of both pulsed and swinging rainfall formation or their combination and thus a large variability in the choice of nozzles according to the purpose of the experiment. Water is pumped by the gas water pump throughout the redistributions and pressure reducing valve, which can manage the required stable pressure. It also contains a datalogger so all measurements and parameters are collected in one device.

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