

Rainfall Simulator Set up and Operation



Note how everything for the simulator is packed into the case so you can get everything back in again.



The infiltration collection trays, soil pans, weirs and weir covers will typically be stored in a separate box from the case containing the rest of the simulator.



Hose and jars removed showing how dividers, rack and sprayer nest together in the case.



Set up rack. Pull one set of pins from leg hinge, swing legs down and replace pins. Align and pin halves of rack together to form whole rack.



Attach the bracket that holds the sprayer to the back side of the rack. There are two black knobs with machine screws that secure the bracket to the rack.



Slip bottom (straight) water pipe through eye bolt in bracket. The bottom end of the pipe has the female hose fitting where the water hose will connect to the pipe. Slide the pipe up so ~5" of pipe extends below the eyebolt and tighten the eyebolt securely.



Carefully thread the upper section of the water pipe onto the lower section and turn it so the sprayer head is perpendicular to the rack and directly over the trays.



Secure metal “T’s” through eyebolts. These hold the back end of each tray to provide slope for the trays to drain runoff water to the front collection jars. Typically, the “T’s” are set two notches above the top edge of the rack to provide adequate slope to the trays. In the image below, only four “T’s” were set for four trays.



Set the back end of each tray on a “T” and the front end so it fits behind the stop on the front edge of the rack. The lower end of each tray has holes and a hook to hang a jar beneath to catch water that infiltrates through the pan of soil.



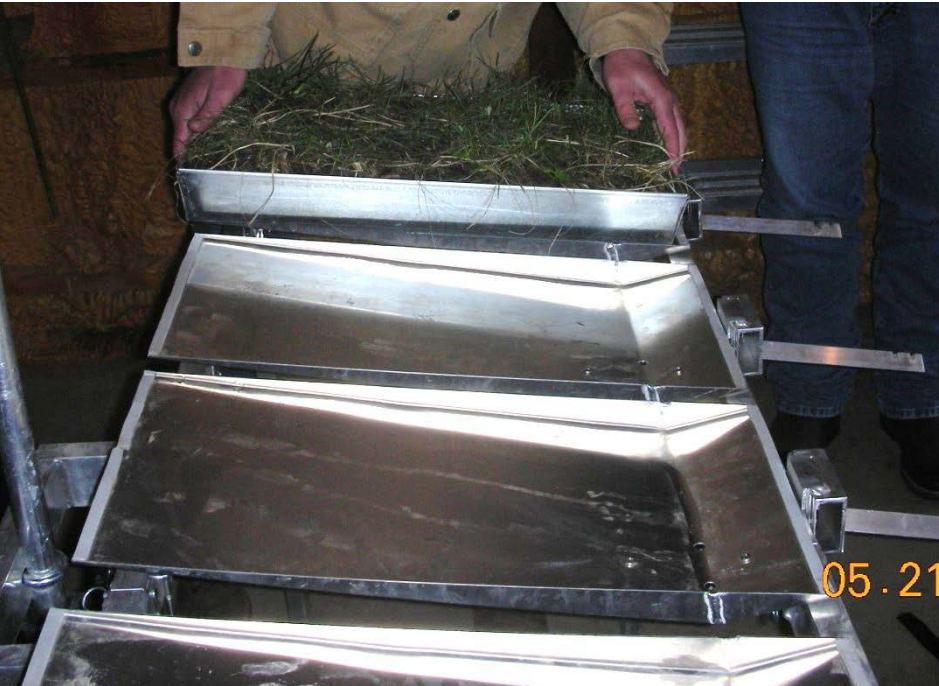
Connect the electrical supply to the wire that leads to the the sprayer (left). Connect the water supply to the bottom of the sprayer pipe, then to the pressure regulator, then to the pressurized water supply. The hose in the lower left of the center image goes to the pressurized water supply and the hose in the upper part of the image goes to the sprayer pipe. An inline valve is also available to install between the pressurized water supply hose and the pressure regulator to make turning on and off of the water supply more convenient.



It is recommended that the water sprayer be run at this point to be sure the sprayer covers all of the trays and sprays beyond the last tray on each side. The water pressure should be set to 3 psi using the adjustment screw on the pressure regulator. Attach the runoff jar brackets to the front edge of the rack at the lower end of each tray. The trays may need to be adjusted to be centered on each bracket.



Set each pan of soil over the infiltration collector trays. The soil pans sit **on top** of the collector trays, **not inside** of them. Care must be taken to position the soil pans correctly over the collector trays or infiltration water may be lost.



Install the runoff weirs to the lower edge of each soil pan. The Weirs have a fold that slips over the edge of the soil pan. The flexible tabs should be positioned inside the soil pans to direct any runoff into the weir.



Hook the plastic covers over the weirs. The covers prevent water from falling directly from the sprayer into the runoff jars.



Remove the lids from the jars. Hang a jar by an “S” hook on the hook under the infiltration collection tray holes (left). Hang a jar by the bail on the end notch of the bracket at the lower end of the soil tray to collect any runoff water (right).



Soil pans, infiltration collection trays, runoff weirs, weir covers and all jars in place. The soil pans should be level full so any runoff will flow unimpeded down the weir.



Assemble the two halves of each panel and install them on the rack. One panel will serve as a backdrop for the soil trays and the other panel will serve as a screen to hide the infiltration jars from view while the rainfall simulator is in operation (this allows the audience to focus on runoff first, then the infiltration jars can be exposed to show the difference between runoff and infiltration). The images below show the upper panel installation details.



The lower panel hangs by eyebolts and is secured to the front of the rack through holes near the leg brackets.



During operation, the pressure gauge on the sprayer should read approximately 3 psi.
The water should come out of the nozzle like rain, not like a pressure washer.



Place the rain gauge in one of the soil pans. Switch the power to the sprayer on **first**, so the sprayer head is moving, then open the water valve to allow water to flow to the moving sprayer head. After the desired amount of rain is collected in the rain gauge, turn the water off then turn the sprayer head power off.



After the desired amount of water has been applied (usually an inch) the runoff, infiltration, soil aggregate stability, soil porosity, residue cover, soil management history, etc. are discussed to teach the principles of soil health.

