

Using the Leaf Wetness Sensor as a Rain Detector

The Leaf Wetness Sensor was designed to measure the presence and duration of water on leaf surfaces. Some users have found that it can be useful for other purposes as well. Dr. Bruce Bugbee, professor of Crop Physiology at Utah State University, noticed that his Leaf Wetness Sensor revealed interesting phenomena associated with some precipitation events. Here is what he observed on a recent day at the USU Environmental Observatory in Logan, Utah

“Recent data from our weather station provided two examples of the offset in measurement associated with tipping bucket rain gauges. It started raining on campus last night at exactly 20:00 hours, as indicated by the response of the leaf wetness sensor (Figure 1). The first 0.1 mm tip of the rain gauge occurred about 25 minutes later (Figure 2). The resolution for most high-quality tipping bucket rain gauges is listed as 0.1 mm, but this is not the resolution for the first 0.1 mm of rain.

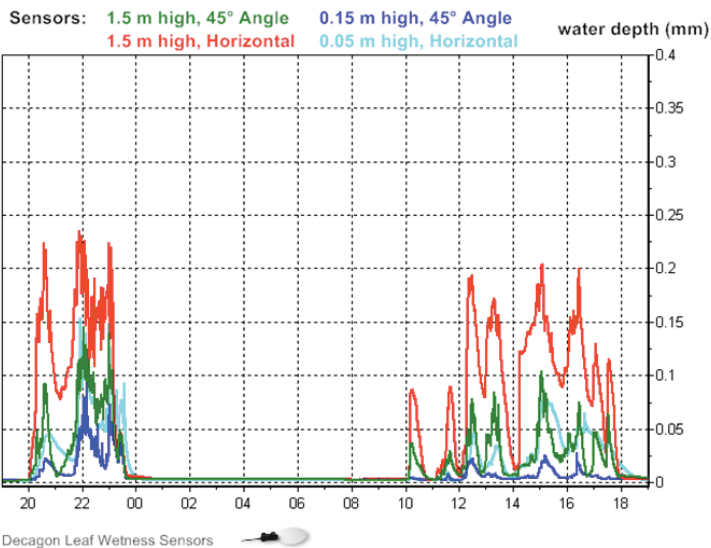


Figure 1. 24 hours of leaf wetness data from 4 Leaf Wetness Sensors installed at the Utah State University Environmental Observatory..

This morning there were two rainfall events of about 0.1 mm each between 10:00 and 12:00. The first tip of the rain gauge occurred at 12:15. Presumably, the first two 0.1 mm doses of rain wet the surfaces of the gauge, but neither dose was sufficient to cause accumulation in the “bucket” below the funnel.

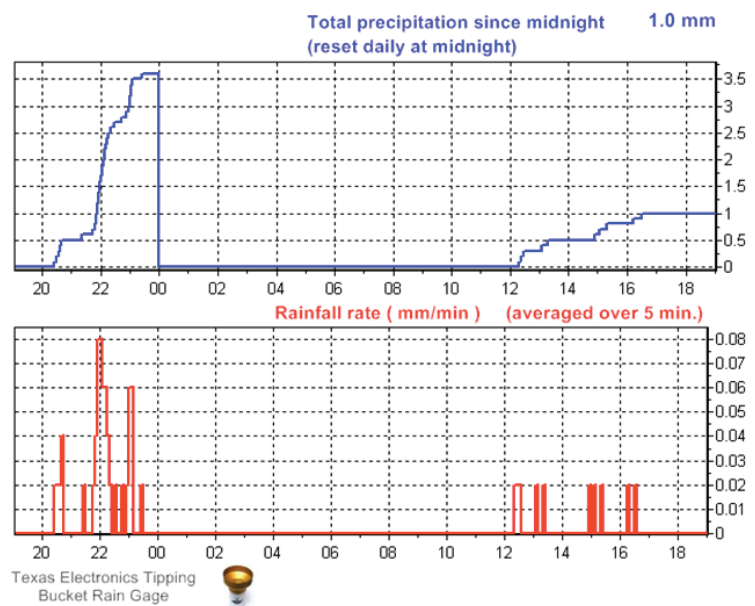


Figure 2. 24 hours of precipitation data from 4 a tipping bucket rain gauge at the Utah State University Environmental Observatory.

It is possible to have a day with numerous 0.1 mm increments of rain, followed by some evaporation, in which a rain gauge would not record any rain during the day. These light rainfall events would wet road surfaces, solar panel surfaces, laundry on the clothes line, and leaf surfaces (causing an increase in the potential for disease). For these reasons, users should consider adding a wetness sensor as a standard component on all weather stations.”