Document Title: Description, AN, Performance of the Decagon rain gauge ECRN		Part # and Rev. 13402-00	
		Release Date: 1-12-07	
Rev.	Description	Revision By	Date

Production Filename: 13402 (In Product Library)

Path to Working Files: DecaDoc\Application Notes\Master

Dimensions: 8.5 inch wide, 11 inch tall

Material: Paper, 92 Bright White or better, 75g/m² or heavier

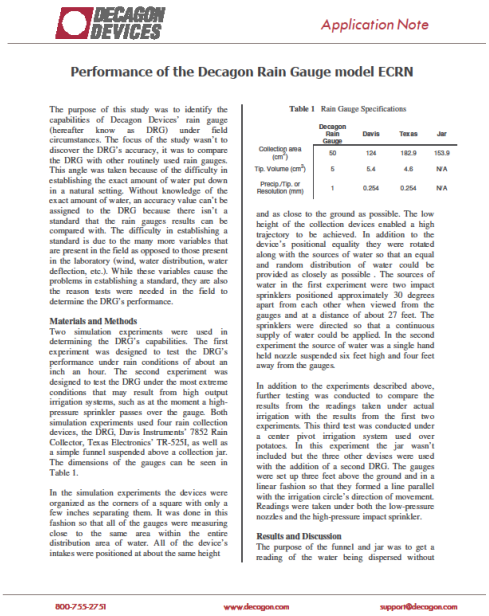
Colors: Color Print on White

Printer: HP Color LaserJet 8550-PS

Finish: None

Adhesive: None

Special Notes: Illustrations are Ref Only ** Not to Scale ** (Shown page 1 of 4)



DECAGON DEVICES Application Note

Performance of the Decagon Rain Gauge model ECRN

The purpose of this study was to identify the capabilities of Decagon Devices' rain gauge (hereafter know as DRG) under field circumstances. The focus of the study wasn't to discover the DRG's accuracy, it was to compare the DRG with other routinely used rain gauges. This angle was taken because of the difficulty in establishing the exact amount of water put down in a natural setting. Without knowledge of the exact amount of water, an accuracy value can't be assigned to the DRG because there isn't a standard that the rain gauges results can be compared with. The difficulty in establishing a standard is due to the many more variables that are present in the field as opposed to those present in the laboratory (wind, water distribution, water deflection, etc.). While these variables cause the problems in establishing a standard, they are also the reason tests were needed in the field to determine the DRG's performance.

Materials and Methods

Two simulation experiments were used in determining the DRG's capabilities. The first experiment was designed to test the DRG's performance under rain conditions of about an inch an hour. The second experiment was designed to test the DRG under the most extreme conditions that may result from high output irrigation systems, such as at the moment a high-pressure sprinkler passes over the gauge. Both simulation experiments used four rain collection devices, the DRG, Davis Instruments' 7852 Rain Collector, Texas Electronics' TR-525I, as well as a simple funnel suspended above a collection jar. The dimensions of the gauges can be seen in Table 1.

In the simulation experiments the devices were organized as the corners of a square with only a few inches separating them. It was done in this fashion so that all of the gauges were measuring close to the same area within the entire distribution area of water. All of the device's intakes were positioned at about the same height

Table 1 Rain Gauge Specifications

	Decagon Rain Gauge	Davis	Texas	Jar
Collection area (cm^2)	50	124	182.9	153.9
Tip, Volume (cm^3)	5	5.4	4.6	N/A
Precip./Tip, or Resolution (mm)	1	0.254	0.254	N/A

and as close to the ground as possible. The low height of the collection devices enabled a high trajectory to be achieved. In addition to the device's positional equality they were rotated along with the sources of water so that an equal and random distribution of water could be provided as closely as possible . The sources of water in the first experiment were two impact sprinklers positioned approximately 30 degrees apart from each other when viewed from the gauges and at a distance of about 27 feet. The sprinklers were directed so that a continuous supply of water could be applied. In the second experiment the source of water was a single hand held nozzle suspended six feet high and four feet away from the gauges.

In addition to the experiments described above, further testing was conducted to compare the results from the readings taken under actual irrigation with the results from the first two experiments. This third test was conducted under a center pivot irrigation system used over potatoes. In this experiment the jar wasn't included but the three other devises were used with the addition of a second DRG. The gauges were set up three feet above the ground and in a linear fashion so that they formed a line parallel with the irrigation circle's direction of movement. Readings were taken under both the low-pressure nozzles and the high-pressure impact sprinkler.

Results and Discussion

The purpose of the funnel and jar was to get a reading of the water being dispersed without