



# Measuring Irrigation Uniformity

Applying water efficiently demands that the sprinkler irrigation system apply water uniformly throughout the irrigated area. The following test procedure collects water in irrigation cups placed throughout the irrigation zone and compares amounts of water collected in the lowest 25% of all cups with the overall average of water collected in all cups. Irrigation uniformity values >80% are generally recommended.

## Procedures for Determining Irrigation Uniformity and Rate

1. Place irrigation gauges (cups, pails, etc.) throughout the irrigation zone. 25-30 gauges per 1000 sq ft of zone is a general guide.
2. Irrigate long enough to collect approx. 0.5 inches of irrigation water. Record irrigation run time in minutes.
3. Measure volume of water collected in each gauge. Keeping track of gauge location can help troubleshoot problem areas.

### Calculations (1mL = 1cm<sup>3</sup>)

a) Irrigation gauge area (cm<sup>2</sup>) =  $\pi r^2 = [\text{container diameter (cm)}/2]^2 * 3.14159$

b) Irrigation uniformity = avg. volume collected in lowest 25% of cups / avg. volume collected in all cups \* 100%

c) Irrigation depth (inch) = avg. volume collected (cm<sup>3</sup>) ÷ cup area (cm<sup>2</sup>) ÷ 2.54 cm/inch

d) Irrigation rate (inch/hour) = irrigation depth (inch) ÷ run time (min) \* 60 min/hour

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Fig 1. Irrigation cups are placed throughout the irrigated area to determine uniformity of irrigation water application

### Example

**Data** Irrigation gauge diameter = 9 cm

Total number of irrigation cups = 60

Avg. volume of water collected in all 60 cups = 68 cm<sup>3</sup>

Avg. volume of water collected in lowest 15 out of 60 cups = 51 cm<sup>3</sup>

Irrigation run time = 45 min

### Calculations

a) Irrigation gauge area =  $\pi r^2 = (9 \text{ cm}/2)^2 * 3.14159 = 63.6 \text{ cm}^2$

b) Irrigation uniformity =  $51 \text{ cm}^3 / 68 \text{ cm}^3 * 100\% = \mathbf{75\%}$

c) Irrigation depth =  $68 \text{ cm}^3 \div 63.6 \text{ cm}^2 \div 2.54 = 0.42 \text{ inch}$

d) Irrigation rate =  $0.42 \text{ inch} * 60 \div 45 = \mathbf{0.56 \text{ inch/hour}}$