-Irrigation definitions-

Precipitation rates:

Square spacing **Triangular spacing**

$$iph(gross) = \frac{96.3 \times gpm}{S \times R} \qquad iph(gross) = \frac{96.3 \times gpm}{S \times R \times 0.866}$$

S = spacing between sprinklers in a row (feet)
R = spacing between rows (feet)
0.866 = sine of 60°

$$96.25(96.3) = \frac{ft3}{7.48} \times \frac{60\min.}{hour} \times \frac{12in.}{ft.}$$

$$34650 = \frac{ft3}{7.48} \times \frac{60\min.}{hour} \times \frac{12in.}{ft.} \times 360\circ$$

Any arc:

$$IPH(gross) = \frac{34650 \times gpm}{ft2 \times arc\circ}$$

-or-

Net precipitation rate = <u>Avg. catch vol. (ml) x 3.66</u>
Runtime (min.) x Area of catchcup (sq. in.)

$$3.66 = \frac{60\min.}{hr.} \times \frac{in3.}{16.38ml}$$

Net precipitation rate = <u>Avg. catch vol. (ml) x 23.62</u>
Runtime (min.) x Area of catchcup (sq. cm.)

$$23.62 = \frac{60\min.}{hr.} \times \frac{1in.}{2.54cm}$$

Irrigation Definitions (cont.)

Coefficient of Uniformity (CU)

- **CU = 100 (1-D/M)**
- **D = (1/n) $\sum$ |Xi-M |**
- **M = (1/n) $\sum$ Xi**
- **Where: CU = Christiansen's Coefficient of Uniformity (%)**
- **D = Average Absolute Deviation From the Mean**
- **M = Mean Application**
- **Xi = Individual Application Amounts**
- **n = Number of Individual Application Amounts**

Conversion Factors for irrigation

1 psi = 2.31 feet of water column
1 acre-inch = 27,154 gallons
1 cfs = 449 gpm
1 acre = 43560 ft^2
1 cubic foot = 7.48 gallons
1 acre-inch / hour = 453 gpm
1 million gal. per day (mgd) = 694.4 gpm
1 horsepower = 0.746 kilowatts

Low quarter Distribution Uniformity (DU_{lq})

DU = [average of low 25% / overall average] X 100

$$DUlq = \frac{avgoflowQ}{overallavg} x100$$

Runtime Minutes= Target irrigation (min.) x 60
Precip. Rate (inches/hour)

Inches (depth) = 1.604 x gallons / Ft^2

$$1.604 = \frac{ft3}{7.48gal.} x \frac{12in.}{ft} x \frac{1}{ft2}$$

Landscape water requirement (gallons) =

[(ET_o x Kc) - rain] x Ft^2 x 0.6233

$$0.6233 = \frac{7.48gal.}{ft3} x \frac{1ft.}{12in.}$$