

More about plant water requirements

Many factors such as climate, seasons, soil, age, geography, sun and shade effect the water requirements of your plants. The Rules of Thumb in the front part of each section of this booklet and the Watering Guidelines in Section 8 are very general in nature and simply designed to get you started in the right direction. If you would like to calculate more precisely the water needs of individual plants, you can use the following formula which was originally developed for agricultural use.

$$\text{Gallons per Day Required by Plant} = \frac{.4893 \times D^2 \times PF \times ET_0}{EF}$$

Where: .4893 is a conversion factor.

D^2 is the plant's canopy diameter in feet squared.

PF is the Plant Factor (See Table 9.1).

EF is the Drip Watering Efficiency expressed as a decimal for a given climate condition (see Table 9.2).

ET_0 is the Evapotranspiration Rate - The amount of water lost to the atmosphere by a reference plant and its surrounding soil. ET_0 is dependent on your local weather conditions (see Table 9.3).

Table 9.1: Plant Use Factor for various landscape plants (PF)*

Plant Type	Plant Factor-PF
◆ Trees and Shrubs/Vines	
Large Trees (mature)	.80
Medium Trees	.75
Small Trees	.70
Shrubs/Vines over 4' high	.70
Shrubs under 4' high	1.00
Fruit Bearing Trees	1.00
◆ Flower Beds and Ground Cover	
Flower Beds	1.00
Ground Cover	1.00
◆ Vegetable Gardens	1.00
◆ Container Plants	1.00
◆ Arid Climate Native Plants	.35-.45

*Note: Data in this table is based on a recently begun preliminary scientific study of landscape plants. More up to date data may be available from your local agricultural agent.

Table 9.2: Drip Watering Efficiency (EF)

Climate Type	Drip Watering Efficiency - EF (Decimal Equivalent)
Hot	.85
Moderate-Warm	.90
Cool	.95

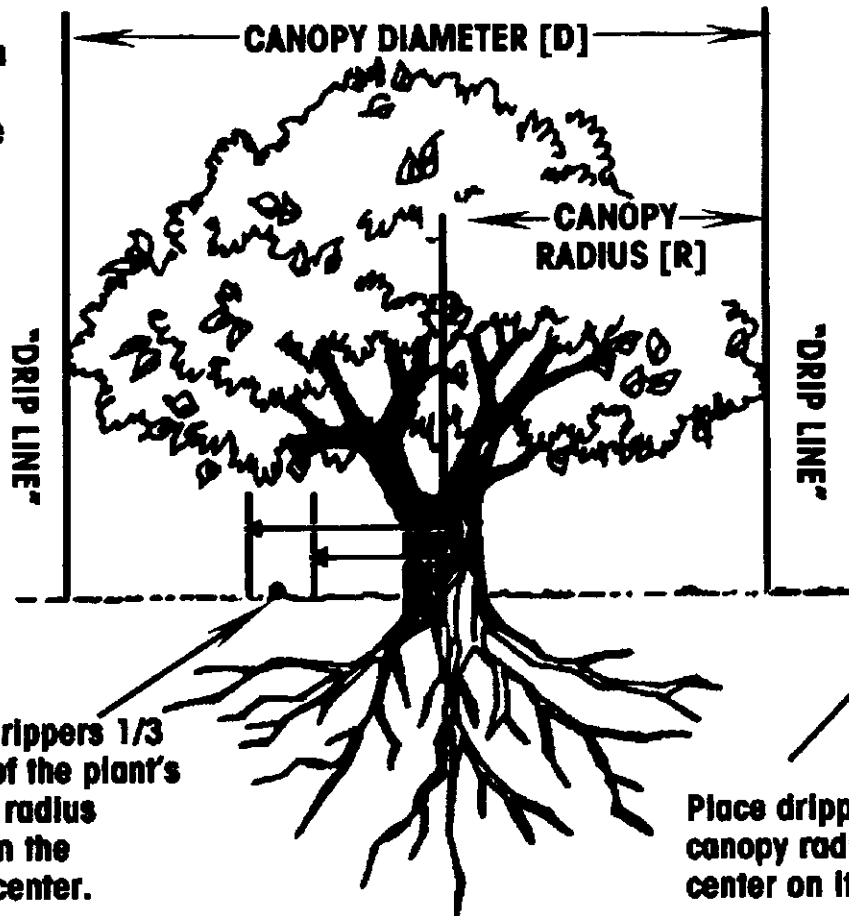
Table 9.3: Evapotranspiration Rate (ET_0)*

Climate	Average High Temperature (F°)	Evapotranspiration Rate- ET_0 (Inches Day)
Cool Humid	Under 70°	.10
Cool Dry	Under 70°	.15
Moderate Humid	70°-80°	.20
Moderate Dry	70°-80°	.25
Warm Humid	80°-100°	.30
Warm Dry	80°-100°	.35
Hot Humid	100°+	.40
Hot Dry	100°+	.45

*Note: Data in this table is based on a recently begun preliminary scientific study of landscape plants. More up to date data may be available from your local agricultural agent.

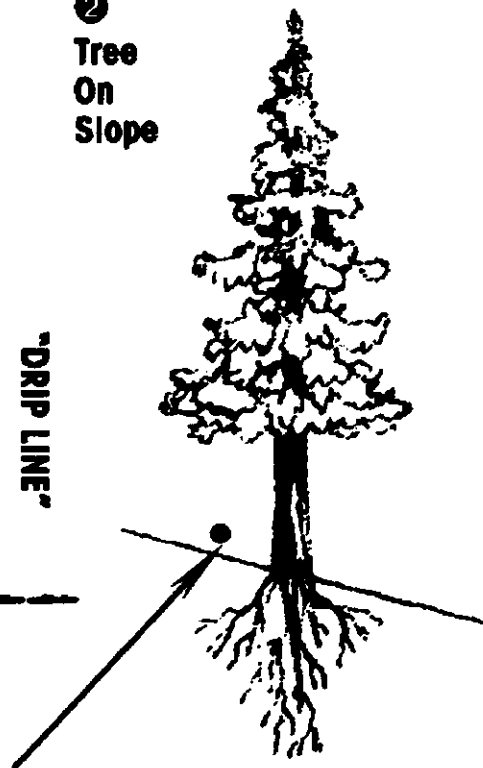
Dripper Placement In Relation To Canopy Diameter

①
Tree On
Level
Surface



Place drippers 1/3 to 1/2 of the plant's canopy radius out from the plants center.

②
Tree
On
Slope



Place drippers 1/3 to 1/2 of the plant's canopy radius out from the plants center on its uphill side.

1 A B C D E F G H I

2 gals/day
 3 conversion factor
 4 canopy size(diameter)
 5 PF
 6 ETo
 7 EF

$$\text{gal/day} = 0.4893 * D * D * PF * ETo / EF$$

= (conversion factor) * (PF plant Chart) * (Diameter of plant Squared) * (ETo)

(Efficiency of irrigation system)

8
 9

PF CHART	
10 plant type	
11 Tree/shrub/vine	
12 large/mature	0.8
13 medium	0.75
14 small	0.7
15 shrubs/vine/>4'	0.7
16 shrub/vine/<4'	1
17 fruit trees	1
18 flower Bed/groundcover	
19 flower bed	1
20 ground cover	1
21 Vegetable garden	1
22 container plant	1
23 arid climate native	.35- .45
24	
25	

ETo CHART		
climate	ave/high/temp f	eto rates
Cool Humid	Under 70 f	0.1
Cool Dry	Under 70 f	0.15
Mod humid	70-80	0.2
Mod dry	70-80	0.25
Warm Humid	80-100	0.3
Warm Dry	80-100	0.35
Hot Humid	100 +	0.4
Hot Dry	100 +	0.45

EF CHART	
CLIMATE	drip efficiency
hot	0.85
moderate-warm	0.9
cool	0.95