

# Irrigation



# Irrigation Requirements

- Know how much your plants need.
- Know how much water each part of your watering system applies.
- Match your system's output to your plant's needs.



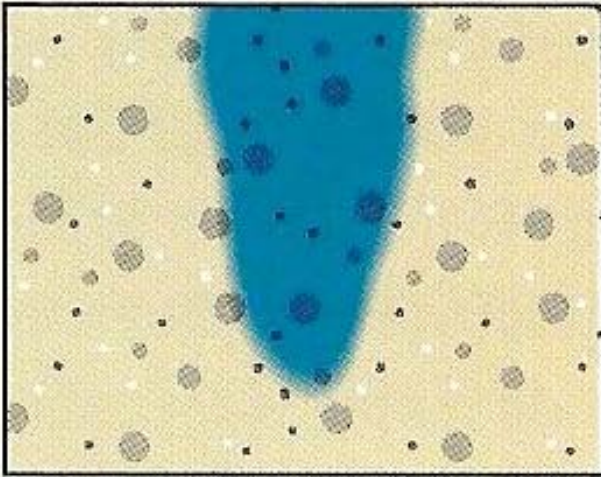
# Irrigation System Factors

- ◆ Soil type and condition
- ◆ Plant type and plant size
- ◆ Condition of the water
- ◆ Weather and climate information

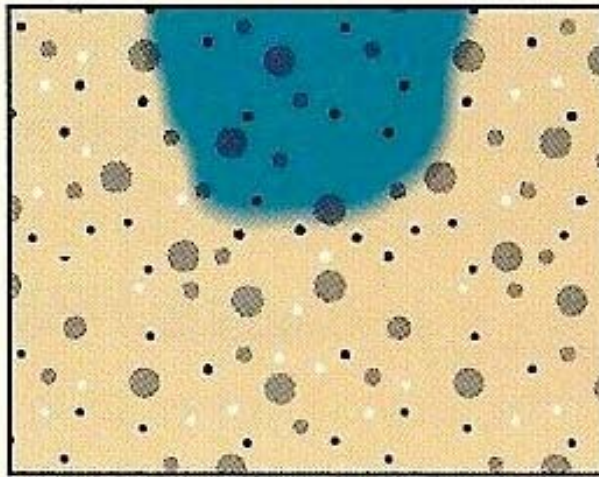


## COMPARATIVE WETTING PATTERNS FOR DIFFERENT SOIL TYPES

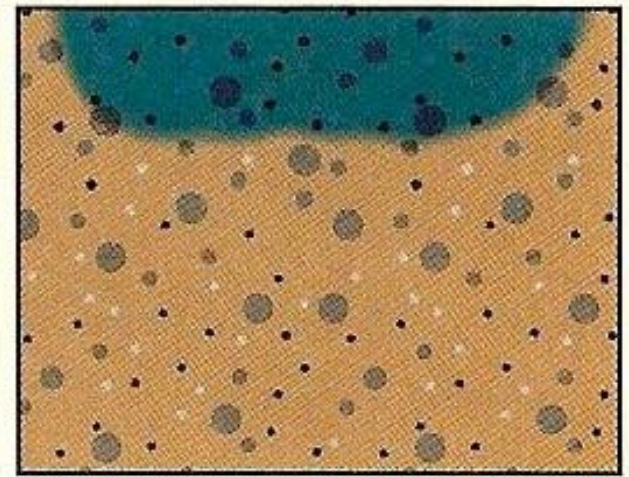
Sand



Loam

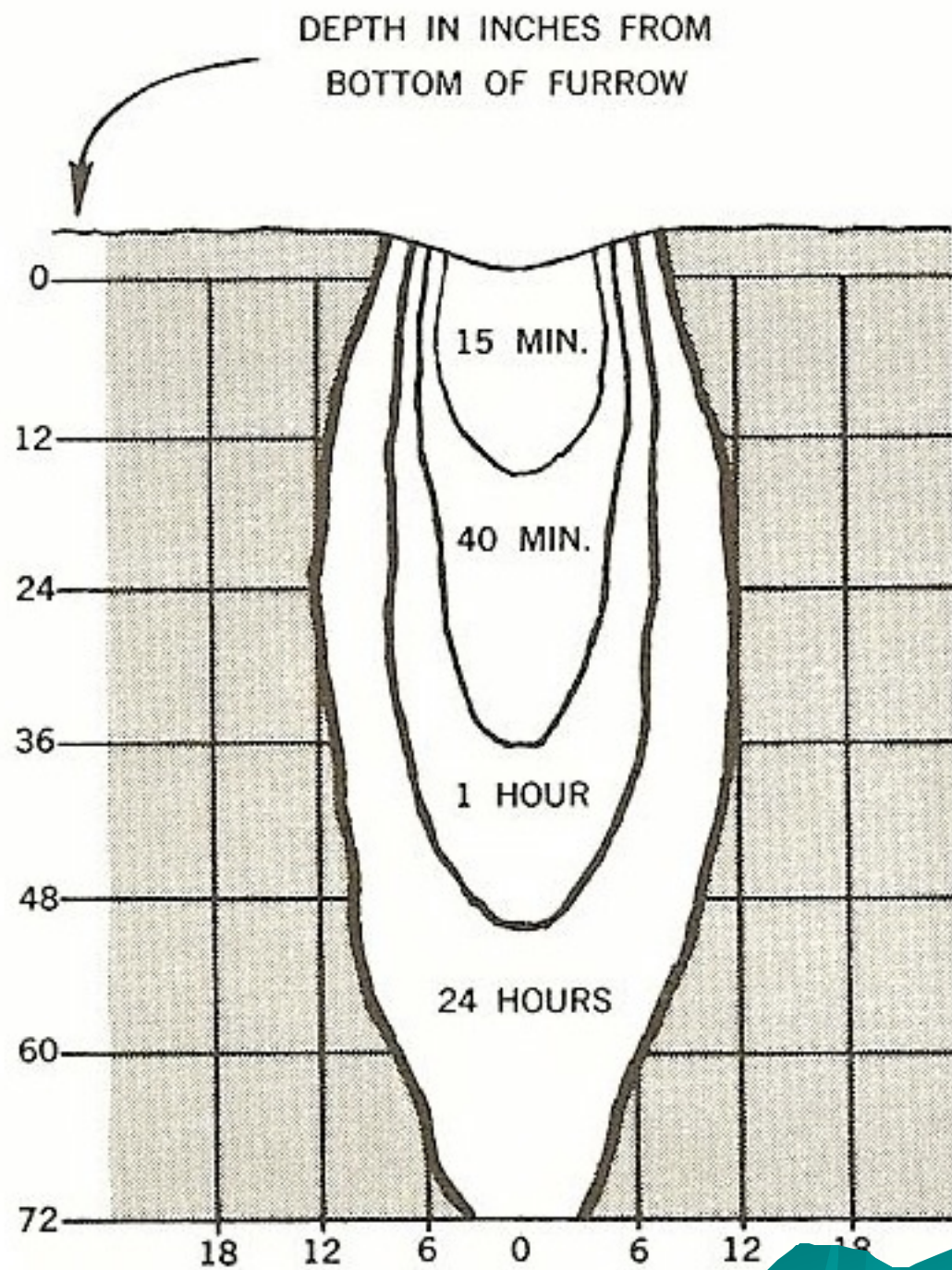


Clay



One inch of water applied to the soil surface will penetrate approximately 12 inches in sand, approximately 7 inches in loam, and approximately 5 inches in clay soil.





# How Much Water Do Your Plants Need





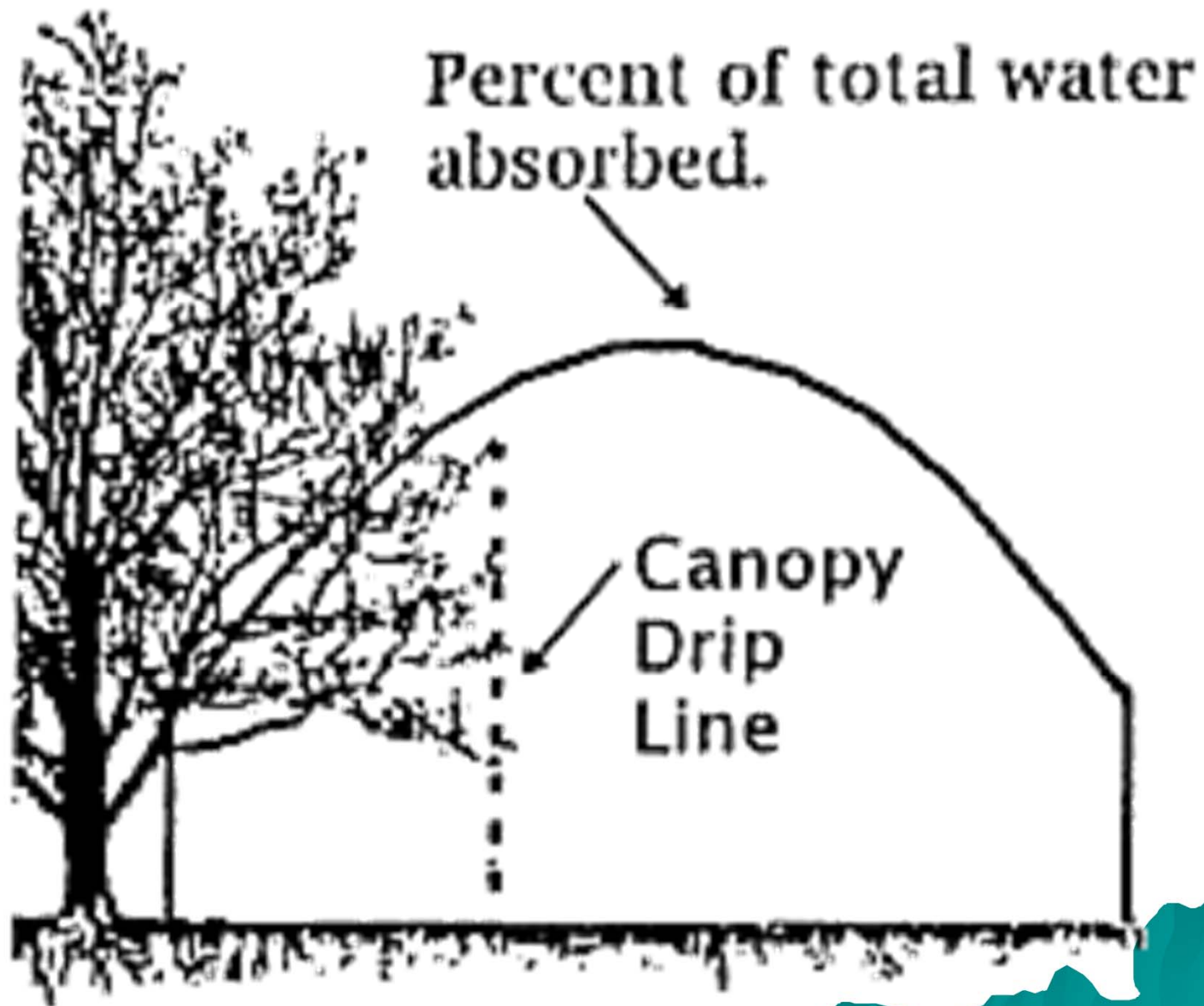


TABLE C: GALLONS OF WATER REQUIRED TO WET ROOT ZONE

Plant Canopy Diameter in Feet

Plant Type	Plant Canopy Diameter in Feet												
	1'	2'	3'	4'	5'	6'	8'	10'	12'	14'	16'	18'	20'
Trees	1.5	5	11	16	22	26	38	59	85	115	150	190	235
Shrubs	1	4	8	12	17	20							
Groundcover/Cacti	.5	2	3.5	5	7	9							





# How Often Do We Need to Water?



### WATERING SCHEDULE FOR NEWLY PLANTED DESERT ADAPTED PLANTS\*

<b>Weeks 1 &amp; 2</b>	Water every 1-2 days in summer, every 3-4 days fall through spring
<b>Weeks 3 &amp; 4</b>	Water every 3-4 days in summer, every 6-7 days fall through spring
<b>Weeks 5 &amp; 6</b>	Water every 4-6 days in summer, every 7-10 days fall through spring
<b>Weeks 7 &amp; 8</b>	Water every 7 days in summer, every 10-14 days fall through spring
<b>After week 8</b>	Gradually extend the time between irrigations until plants are established.

Note: After the eighth week, move the drip emitters to the outer edge of the root ball.

\* High water use plants will require more frequent irrigations.





# LANDSCAPE WATERING GUIDELINES

How Much & How Often Water to the outer edge of the plant's canopy and to the depth indicated. Watering frequency will vary depending on season, plant type, weather and soil.		Seasonal Frequency — Days Between Waterings				Water This Deeply (Typical Root Depth)
		Spring Mar - May	Summer May - Oct	Fall Oct - Dec	Winter Dec - Mar	
Trees	Desert adapted	14-30 days	7-21 days	14-30 days	30-60 days	24-36 inches
	High water use	7-12 days	7-10 days	7-12 days	14-30 days	24-36 inches
Shrubs	Desert adapted	14-30 days	7-21 days	14-30 days	30-45 days	18-24 inches
	High water use	7-10 days	5-7 days	7-10 days	10-14 days	18-24 inches
Groundcovers & Vines	Desert adapted	14-30 days	7-21 days	14-30 days	21-45 days	8-12 inches
	High water use	7-10 days	2-5 days	7-10 days	10-14 days	8-12 inches
Cacti and Succulents		21-45 days	14-30 days	21-45 days	if needed	8-12 inches
Annuals		3-7 days	2-5 days	3-7 days	5-10 days	8-12 inches
Warm Season Grass		4-14 days	3-6 days	6-21 days	15-30 days	6-10 inches
Cool Season Grass		3-7 days	none	3-10 days	7-14 days	6-10 inches
These guidelines are for established plants (1 year for shrubs, 3 years for trees). Additional water is needed for new plantings or unusually hot or dry weather. Less water is needed during cool or rainy weather. Drip run times are typically 2 hours or more for each watering.						



# How Deep Should You Water?



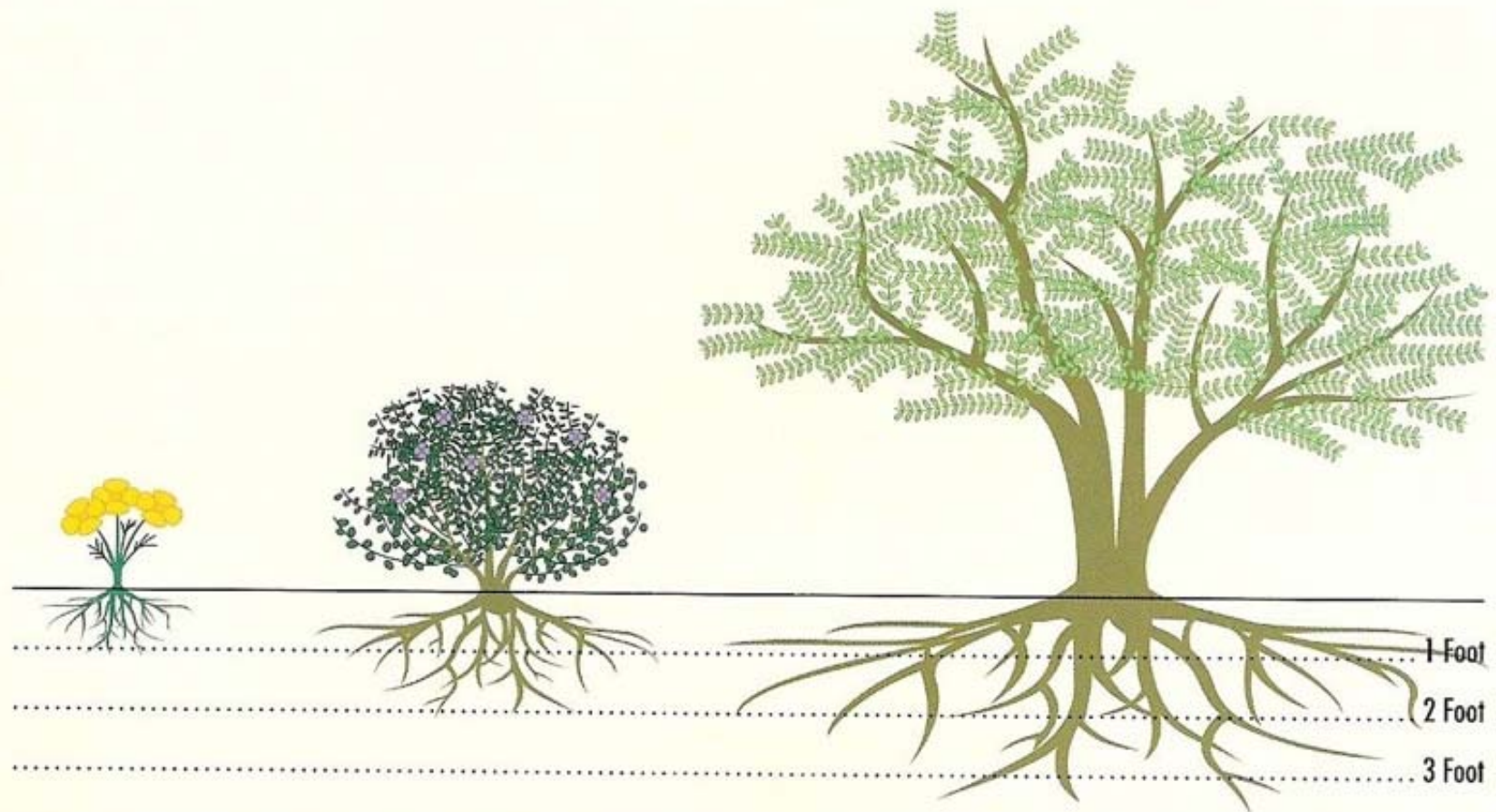
# 1, 2, 3 Rule

Depth	Size of Plants	Examples
1 Foot	Small	Ground covers, cacti and bedding plants
2 Feet	Medium	Shrubs
3 Feet	Large	Trees





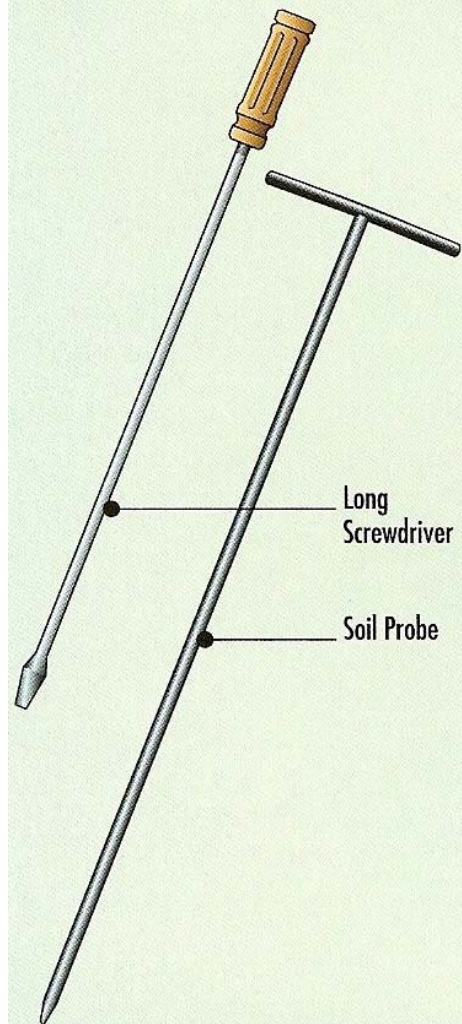
## Suggested Watering Depth for Different Types of Plants





# Soil Probes

A soil probe, sharpened piece of rebar, or a very long screwdriver works well to test how deep the water has penetrated into the soil.



# Irrigation System



# Irrigation System Design Objective

- ◆ Supply adequate water
- ◆ At the correct time and duration



# Irrigation System Types

## ◆ Sprinklers

- Rotating
- Fixed Spray
- Micro

## ◆ Drip

- Basic drip
- Drip tubing
- Bubblers

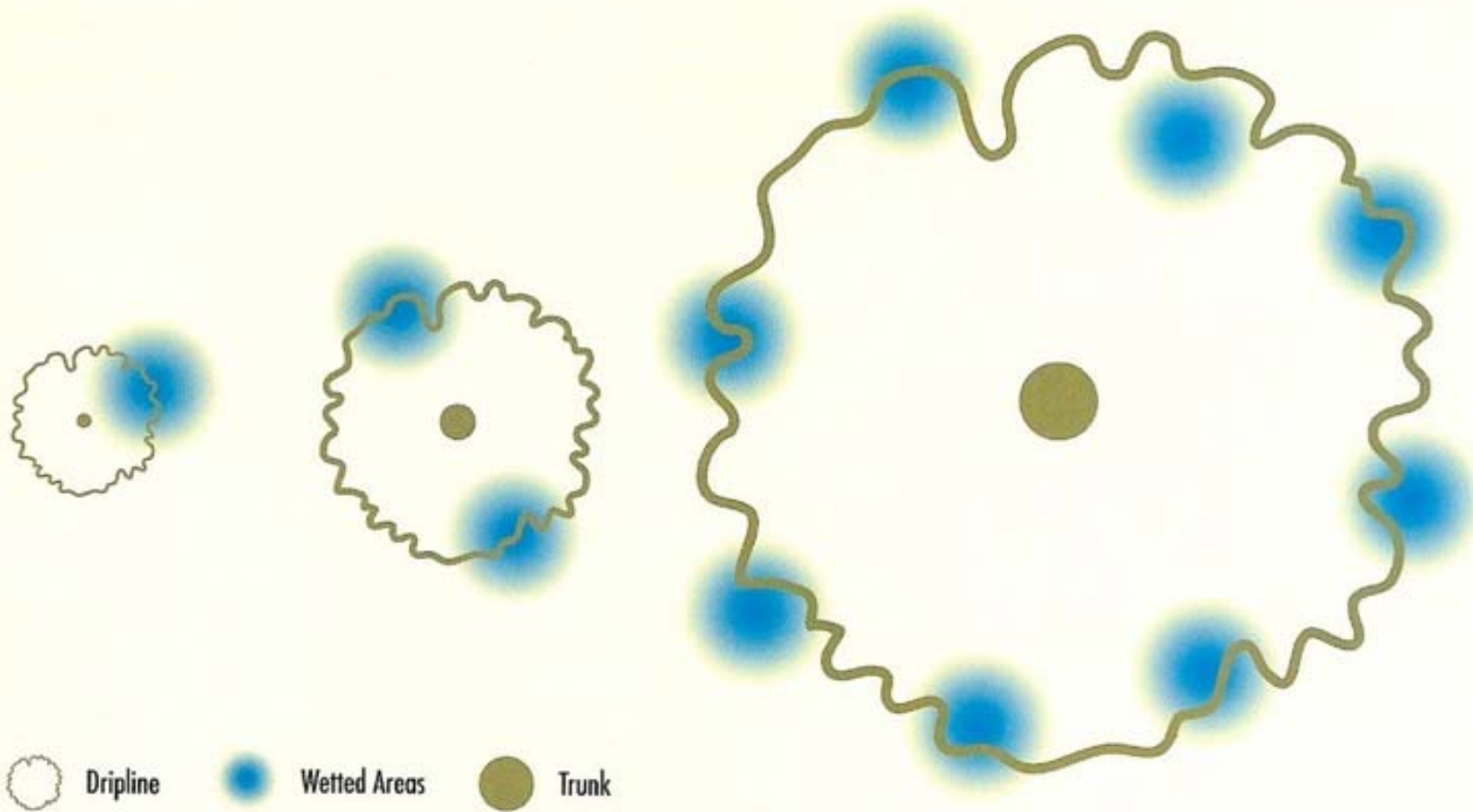


# Irrigation System Factors

- ◆ Irrigation zones
- ◆ Emitters – type, number, location and output
- ◆ Depth



## Place Emitters Along a Plant's Dripline





# Suggested Drip Emitter Quantities

	Canopy Diameter (Feet)	Number of Emitters	Emitter Flow Rate (GPH)
Trees	7 - 10	3 - 5	2 - 4
	11 - 14	4 - 6	2 - 4
	15 - 20	6 - 12	2 - 4
	21+	12+	4
Large Shrubs	4 - 6	2 - 3	2
Small Shrubs/ Groundcovers	1 - 3	1	1



# Estimating Emitter Flow

Use this visual guide to estimate emitter flow rates in gallons per hour (GPH).



TIPS





# Landscape Plant Watering Tips

## **Signs of Underwatering**

- ▶ Older leaves turn yellow or brown and drop
- ▶ Leaves are dull, wilted, or drooping
- ▶ Leaves curl
- ▶ Stems or branches die back

## **Signs of Overwatering**

- ▶ Leaves turn a lighter shade of green or yellow
- ▶ Young shoots are wilted
- ▶ Growth is excessive
- ▶ Algae and/or mushrooms are on or around plants



# Correct Irrigation Losses

- ◆ Spray drift, wind and evaporation
- ◆ Deep percolation
- ◆ Uniformity losses
- ◆ Runoff losses



# Irrigation System Maintenance

- Inspect for proper operation
- Move emitters if required
- Newly planted vs. established plants
- Drain system prior to winter





# Water Wisdom

- ◆ When you give plants more water than they need, they will grow more than they should, and you have to do more pruning and mowing.
- ◆ While fertilizers promote plant growth, they also increase water consumption. Apply the minimum amount of fertilizer as needed.



# Water Wisdom

- ◆ With sprinklers, water in the early morning - about 1 to 3 hours before sunrise.
- ◆ Because of different watering needs, it is best to place trees and shrubs on separate lines.
- ◆ Pull weeds so they do not steal water from your plants



# Water Wisdom

- ◆ If you place mulch over plants' root zones, moisture will stay in the soil longer.
- ◆ Water deep to root zone vs watering often.
- ◆ Do not over water OR underwater.



# Xeriscaping Principles

- ◆ Water-wise planning and design
- ◆ Low water use/drought tolerant plants
- ◆ Limited lawn areas
- ◆ Efficient irrigation design and equipment
- ◆ Water harvesting techniques
- ◆ Surface mulches and soil amendments (where appropriate)
- ◆ Proper maintenance practices

