Keeping Your Landscape Happy?

John K. Shannon

Water Conservation Specialist

City of Roseville Environmental Utilities Department

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Why are we here?

- Maintain Healthy Landscapes
- Learn Water Management
- Potentially Save Water
- Save Money
- Learn about Irrigation Repair

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Right Plant – Right Place

Unhappy Plant Factors

- Sunlight
- Shelter
- Space
  - Root zone
  - Mature size
- Nutrient availability
- Water
  - Too much – Too little
  - Frequency
  - Depth

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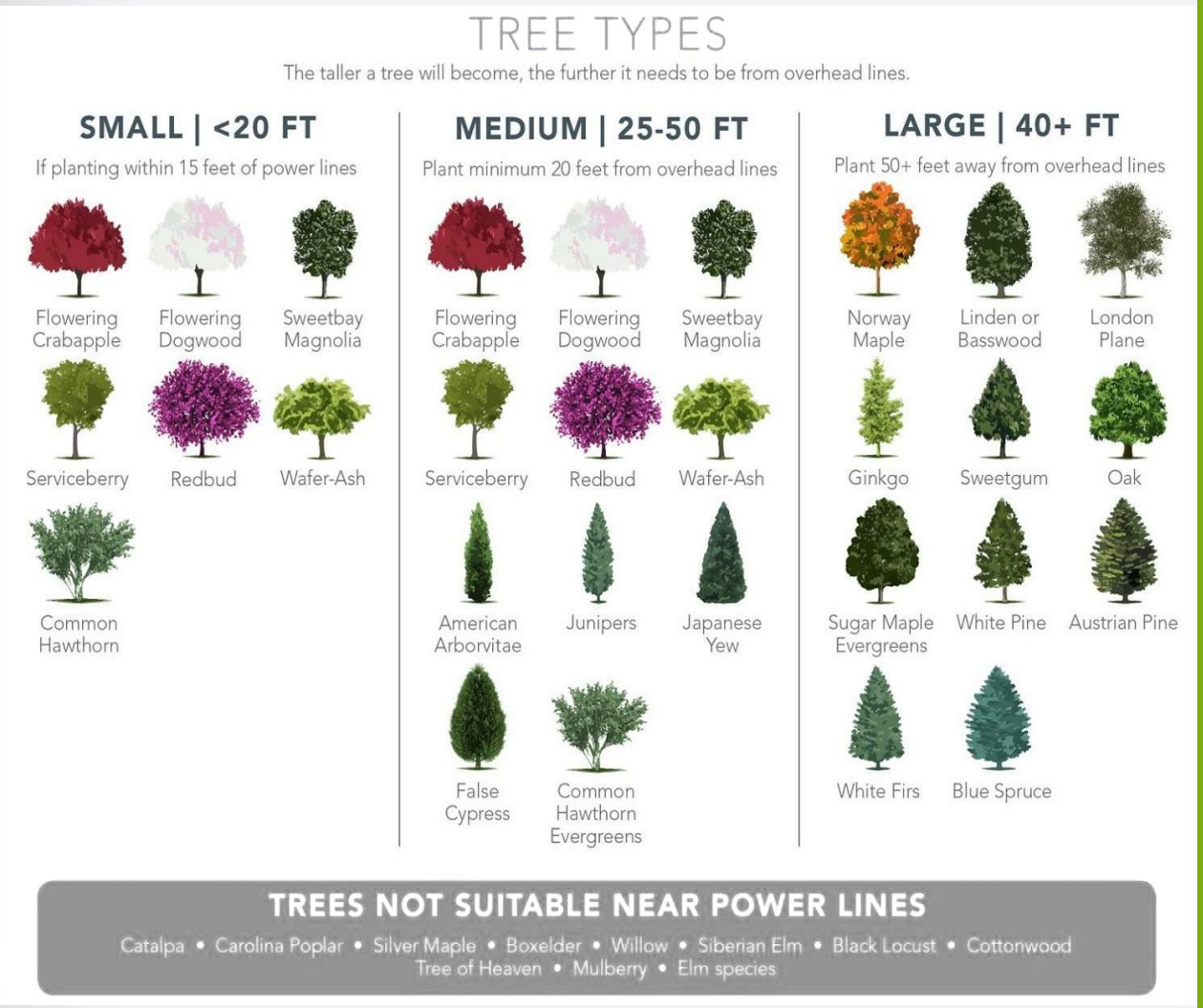

Right Plant – Right Place

Plan First, Plant Once

- This is a process, not a one-time event
- Have a plan
- Know the plants and what they require to thrive
- Utilize regional gardening books and magazines
- Consult with your UC Master Gardener County Extension Office
- Ask qualified nursery professionals for advice

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Right Plant – Right Place?

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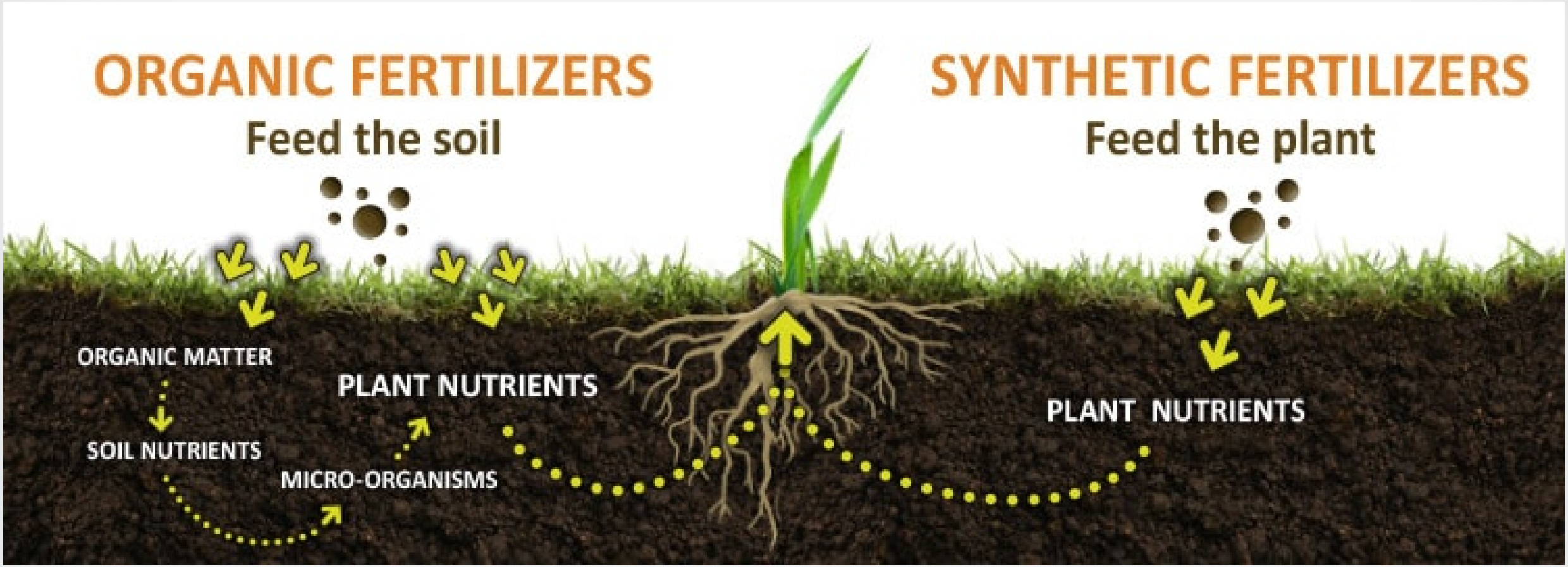
Use Organic Plant Food

MAKING WEED
Compost Tea



Mineralization: The process by which microbes decompose organic (N) to Ammonium. This is from manure, organic matter and crop residues.

Apply Compost Teas, Kelp, and other Foliar as food for your plants.

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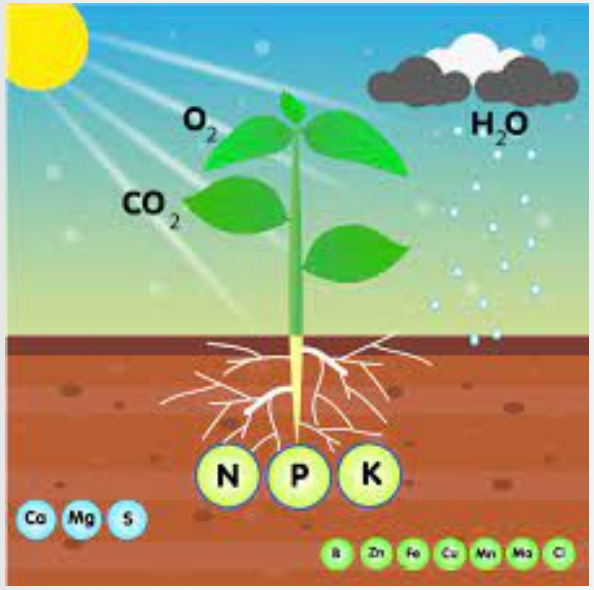
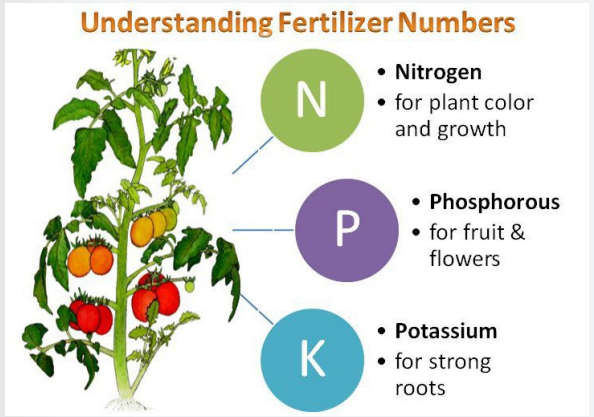
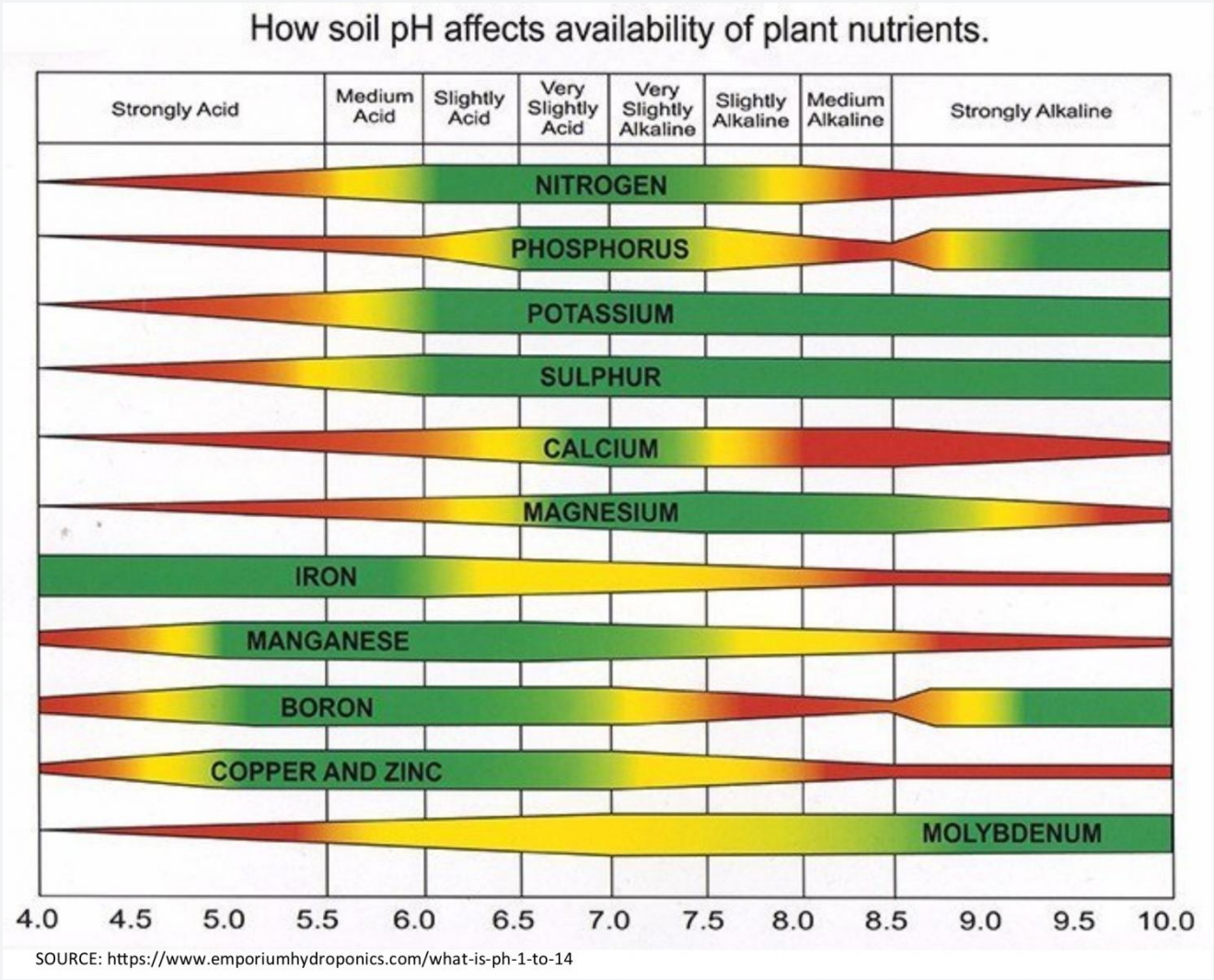
Macro – Micro Nutrients







SOURCE: https://www.emporiumhydroponics.com/what-is-ph-1-to-14

Water for the Plant Requirement not Saturation!

Use an irrigation scheduler for your specific area or zone.

Water with the weather and adjust seasonally.

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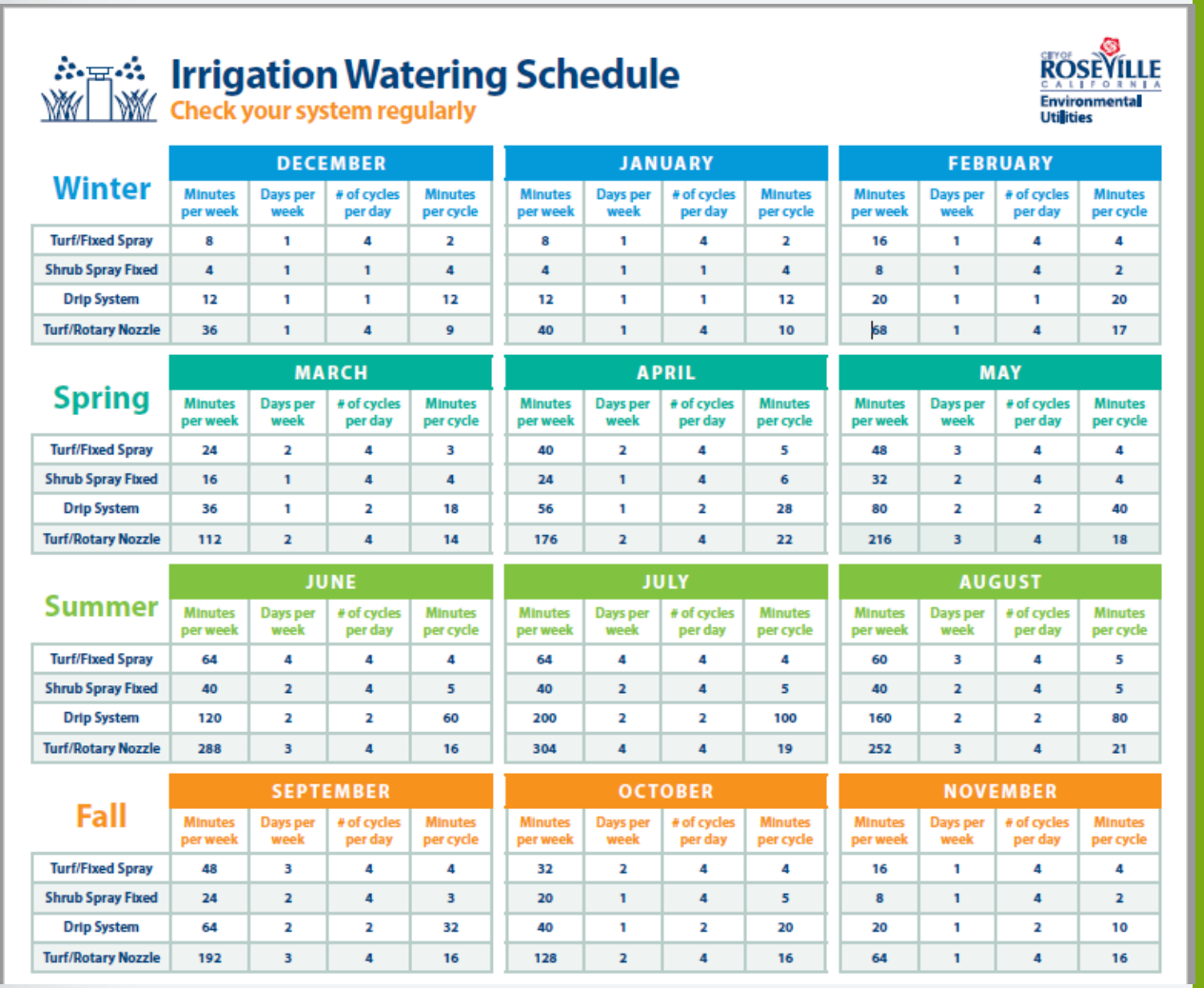

Irrigation Watering Schedule

Check your system regularly

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Winter

	DECEMBER				JANUARY				FEBRUARY			
	Minutes per week	Days per week	# of cycles per day	Minutes per cycle	Minutes per week	Days per week	# of cycles per day	Minutes per cycle	Minutes per week	Days per week	# of cycles per day	Minutes per cycle
Turf/Fixed Spray	8	1	4	2	8	1	4	2	16	1	4	4
Shrub Spray Fixed	4	1	1	4	4	1	1	4	8	1	4	2
Drip System	12	1	1	12	12	1	1	12	20	1	1	20
Turf/Rotary Nozzle	36	1	4	9	40	1	4	10	68	1	4	17

Spring

	MARCH				APRIL				MAY			
	Minutes per week	Days per week	# of cycles per day	Minutes per cycle	Minutes per week	Days per week	# of cycles per day	Minutes per cycle	Minutes per week	Days per week	# of cycles per day	Minutes per cycle
Turf/Fixed Spray	24	2	4	3	40	2	4	5	48	3	4	4
Shrub Spray Fixed	16	1	4	4	24	1	4	6	32	2	4	4
Drip System	36	1	2	18	56	1	2	28	80	2	2	40
Turf/Rotary Nozzle	112	2	4	14	176	2	4	22	216	3	4	18

Summer

	JUNE				JULY				AUGUST			
	Minutes per week	Days per week	# of cycles per day	Minutes per cycle	Minutes per week	Days per week	# of cycles per day	Minutes per cycle	Minutes per week	Days per week	# of cycles per day	Minutes per cycle
Turf/Fixed Spray	64	4	4	4	64	4	4	4	60	3	4	5
Shrub Spray Fixed	40	2	4	5	40	2	4	5	40	2	4	5
Drip System	120	2	2	60	200	2	2	100	160	2	2	80
Turf/Rotary Nozzle	288	3	4	16	304	4	4	19	252	3	4	21

Fall

	SEPTEMBER				OCTOBER				NOVEMBER			
	Minutes per week	Days per week	# of cycles per day	Minutes per cycle	Minutes per week	Days per week	# of cycles per day	Minutes per cycle	Minutes per week	Days per week	# of cycles per day	Minutes per cycle
Turf/Fixed Spray	48	3	4	4	32	2	4	4	16	1	4	4
Shrub Spray Fixed	24	2	4	3	20	1	4	5	8	1	4	2
Drip System	64	2	2	32	40	1	2	20	20	1	2	10
Turf/Rotary Nozzle	192	3	4	16	128	2	4	16	64	1	4	16

How often do I water?

How much should I water?

- What are you watering?
- What is the soil type?
- How long do I water?
- What is the slope?
- How are you watering?
- What is the infiltration rate?
- What is the precipitation rate?
- You may need to cycle and soak

Can you set my timer?

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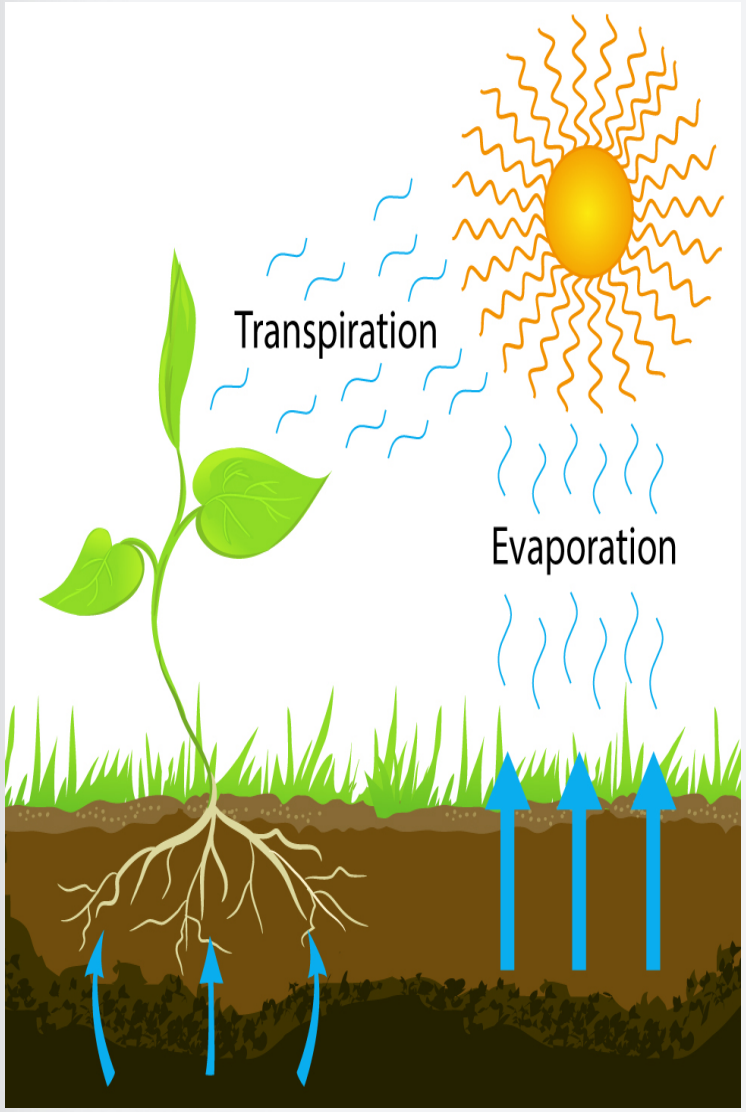
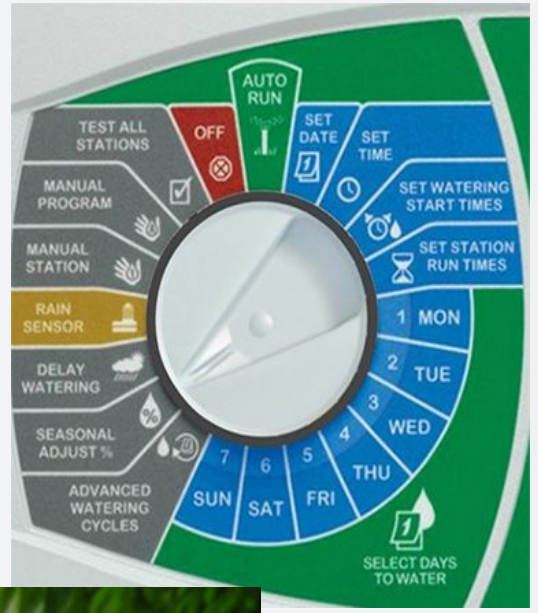
Seasonal Adjustment



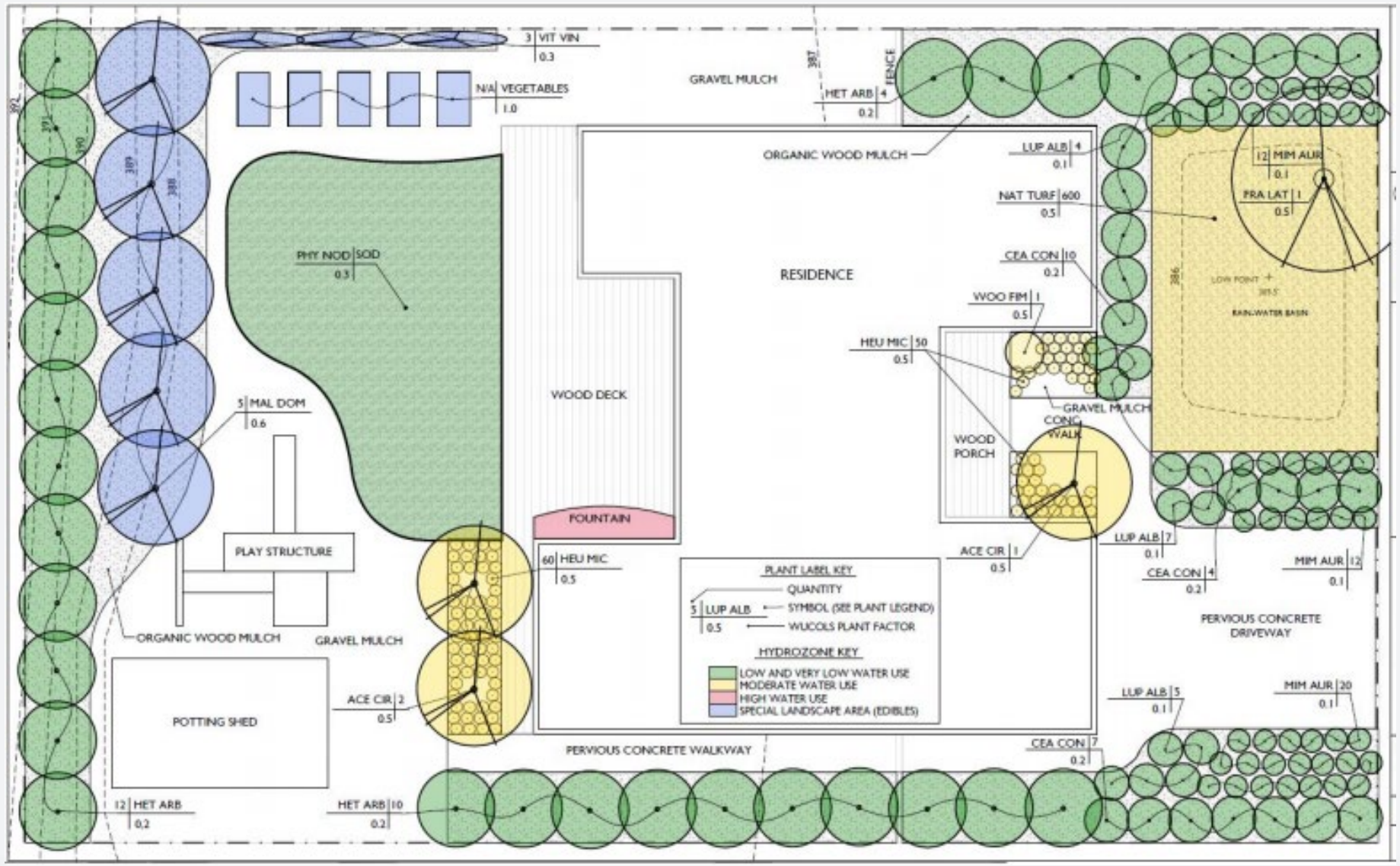
Manually



On Site Sensor

Inches of water annually by plant type

Hydrozones


3 VIT VIN 0.3
N/A VEGETABLES 1.0
GRAVEL MULCH
FENCE
HET ARB 4 0.2
ORGANIC WOOD MULCH
LUP ALB 4 0.1
NAT TURF 600 0.5
12 MIM AUR 0.1
PRA LAT 1 0.5
PHY NOD SOD 0.3
RESIDENCE
CEA CON 10 0.2
WOO FIM 1 0.5
HEU MIC 50 0.5
RAIN WATER BASIN
WOOD DECK
5 MAL DOM 0.6
GRAVEL MULCH
WOOD PORCH
CONC WALK
FOUNTAIN
PLAY STRUCTURE
60 HEU MIC 0.5
ACE CIR 1 0.5
LUP ALB 7 0.1
CEA CON 4 0.2
MIM AUR 12 0.1
PERVIOUS CONCRETE DRIVEWAY
ORGANIC WOOD MULCH
GRAVEL MULCH
PLANT LABEL KEY
QUANTITY
5 LUP ALB SYMBOL (SEE PLANT LEGEND)
0.5 WUCOLS PLANT FACTOR
HYDROZONE KEY
LOW AND VERY LOW WATER USE
MODERATE WATER USE
HIGH WATER USE
SPECIAL LANDSCAPE AREA (EDIBLES)
POTTING SHED
ACE CIR 2 0.5
LUP ALB 5 0.1
MIM AUR 20 0.1
PERVIOUS CONCRETE WALKWAY
CEA CON 7 0.2
12 HET ARB 0.2
HET ARB 10 0.2

High Water Use

Medium Water Use

Low Water Use

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Where can I find a plants water use?

WUCOLS IV
Water Use Classification of Landscape S

Plant Search Database

If you know exactly which plant you are interested in, you may search for it by name (partial names are OK, too). Otherwise, consider searching by plant type and/or water use.

City

Search for a city: Search for a city — or — Find a city on the map

Plant Name

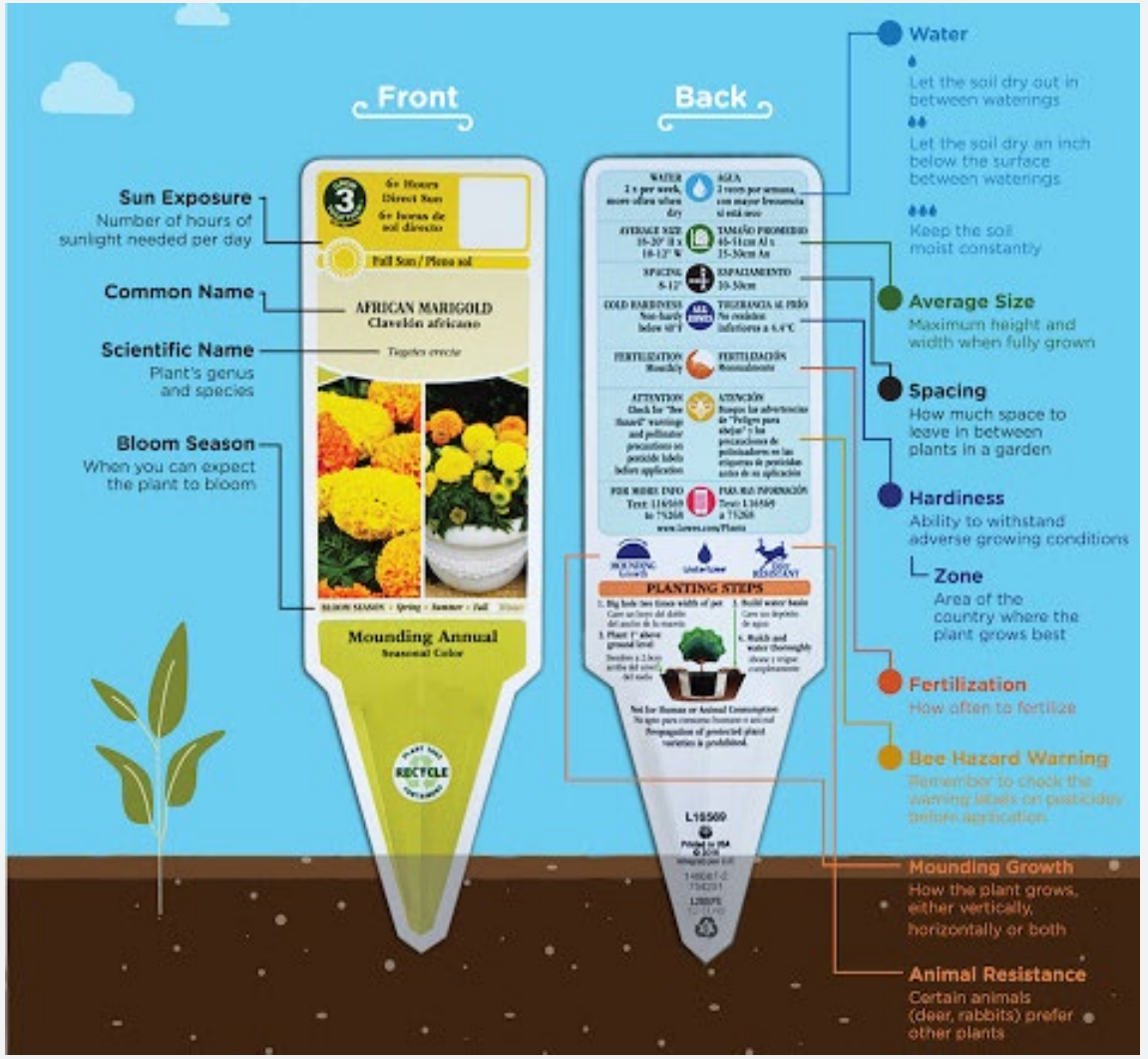
Common Name or Botanical Name

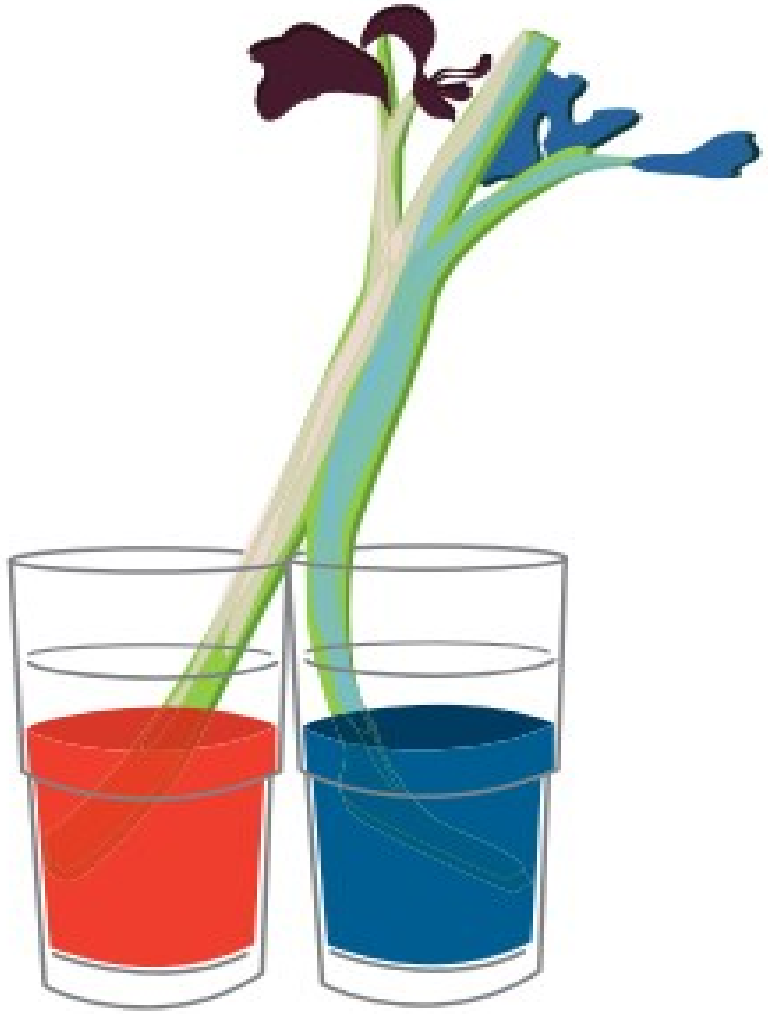
Water Use

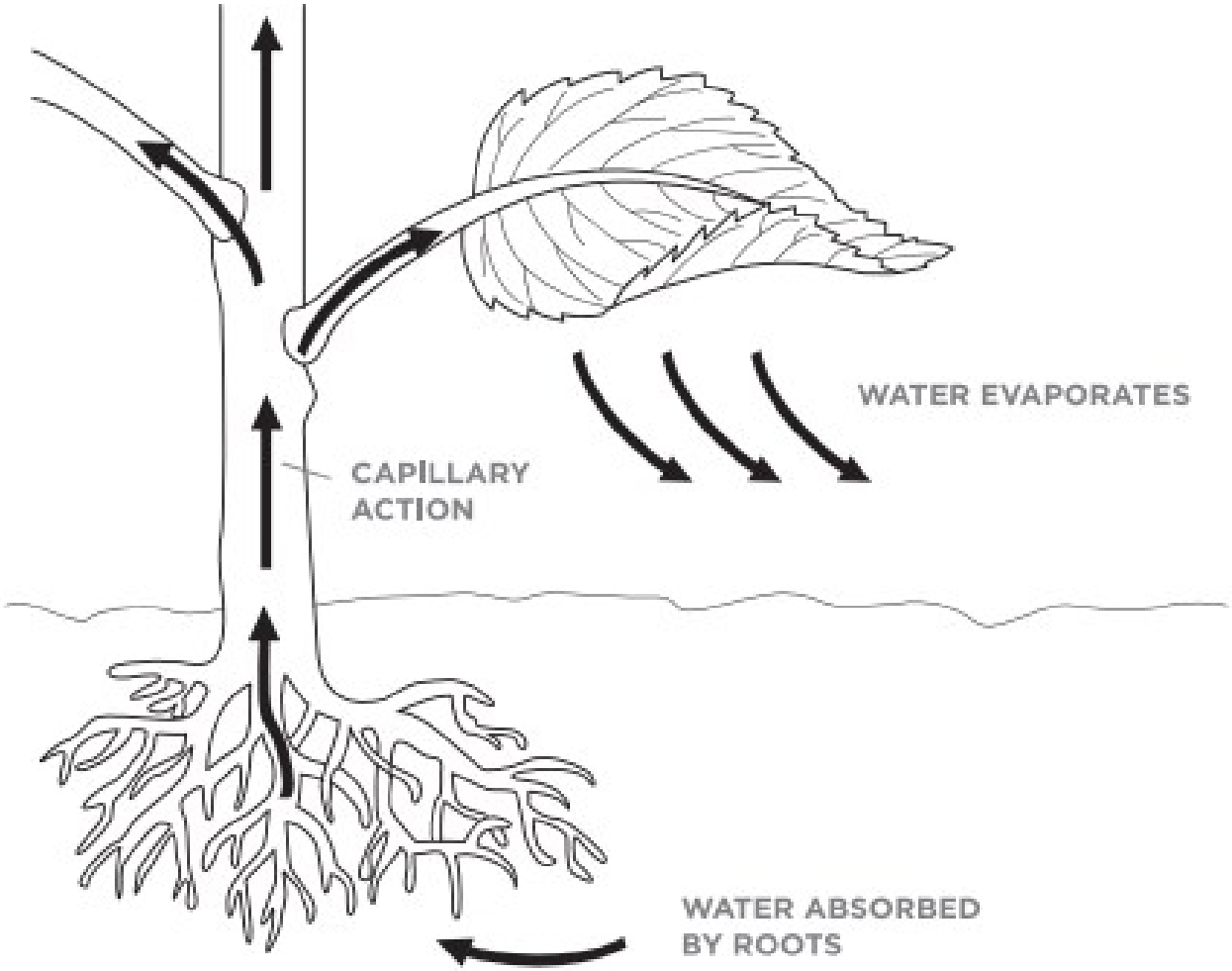
- ☐ Very Low
- ☐ Low
- ☐ Moderate / Medium
- ☐ High
- ☐ Unknown
- ☐ Not Appropriate for this Region

Plant Type

- ☐ **Gc** (Ground Cover)
- ☐ **P** (Perennial)
- ☐ **S** (Shrub)
- ☐ **T** (Tree)
- ☐ **V** (Vine)
- ☐ **Ba** (Bamboo)
- ☐ **Bu** (Bulb)
- ☐ **G** (Ornamental Grass)
- ☐ **Pm** (Palm and Cycad)
- ☐ **Su** (Succulent)
- ☐ **N** (California Native)
- ☐ **A** (Arboretum All-star)







Capillary Action

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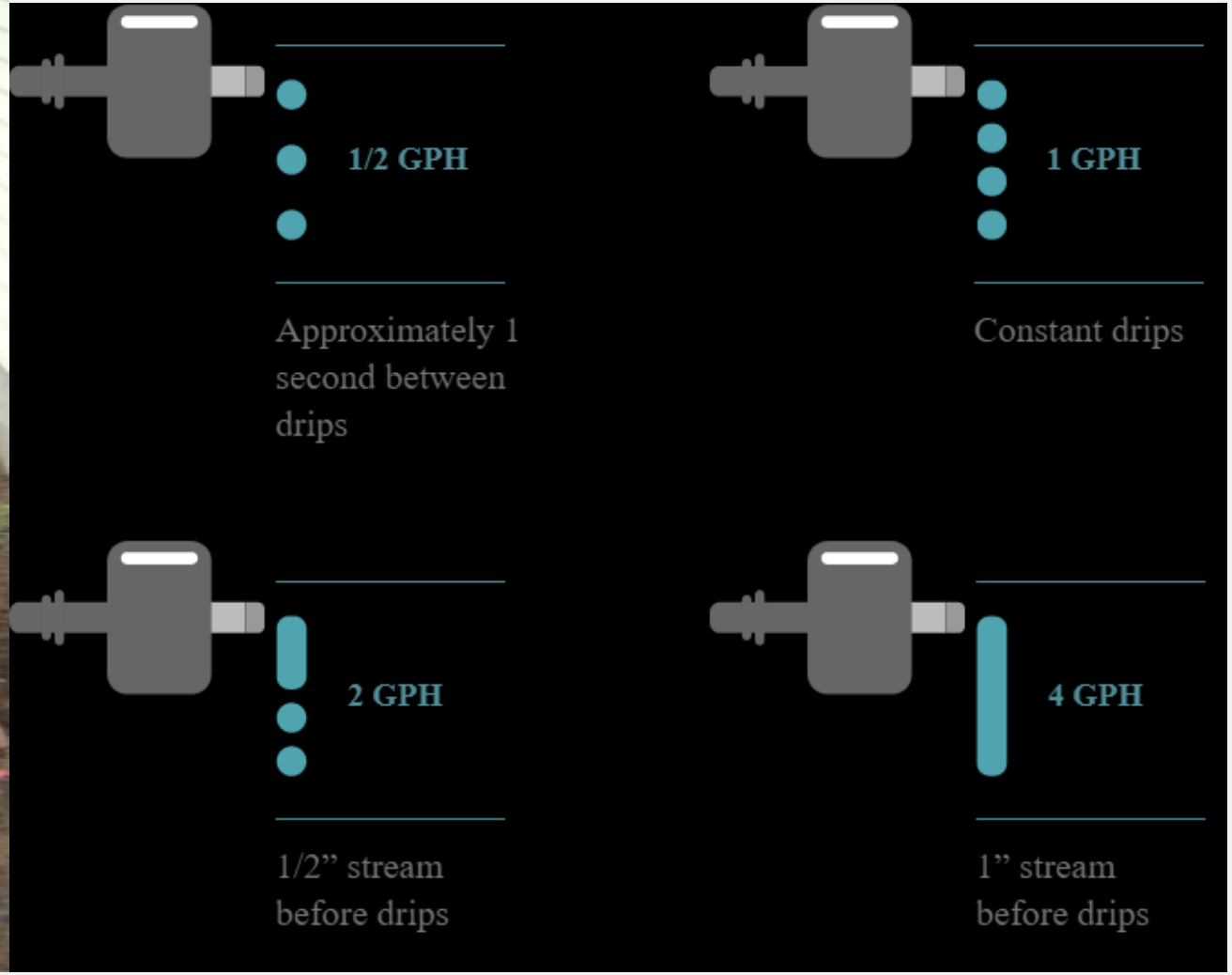
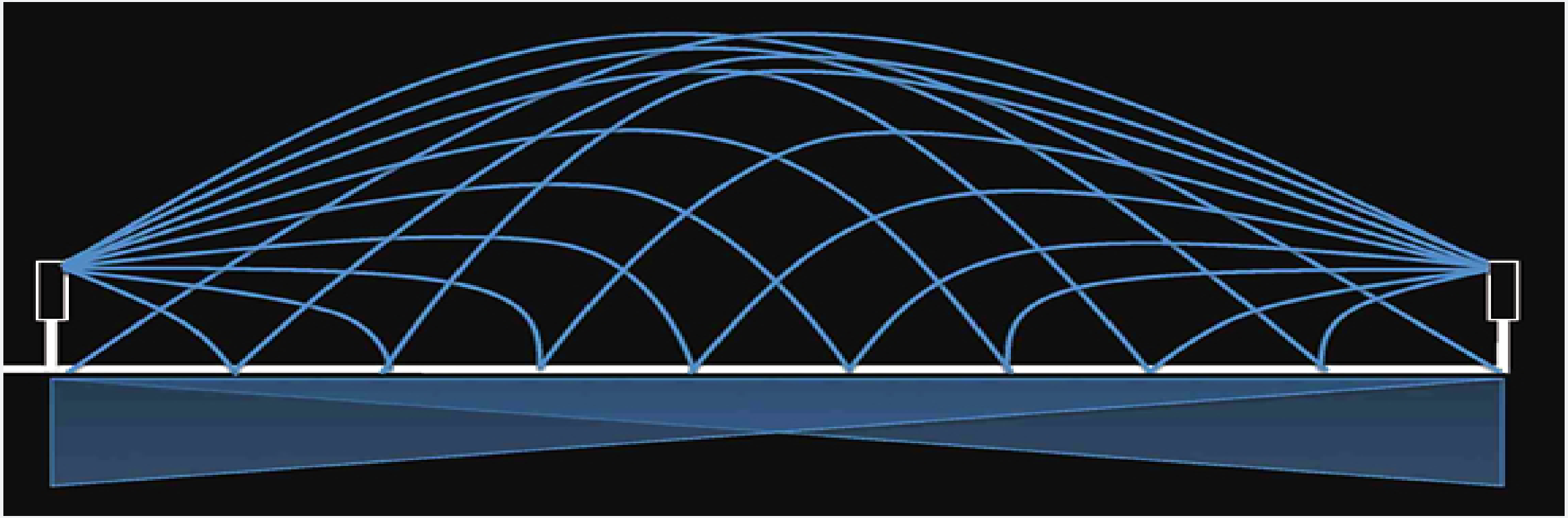
How much water is that?

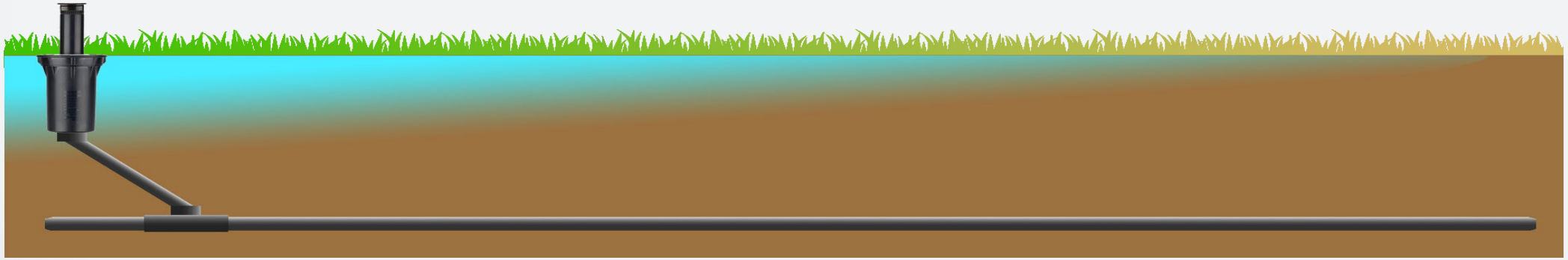
- **5 seconds** with a garden hose
- **10 minutes** with a 1-gallon per minute bubbler
- **600 minutes or 10 hours** with a 1-gallon per hour drip emitter

Drip


1/2 GPH
Approximately 1 second between drips
1 GPH
Constant drips
2 GPH
1/2” stream before drips
4 GPH
1” stream before drips

Distribution Uniformity





Overwatering

Overwatering - Saturation - Yellowing

Frequency and / or duration too long

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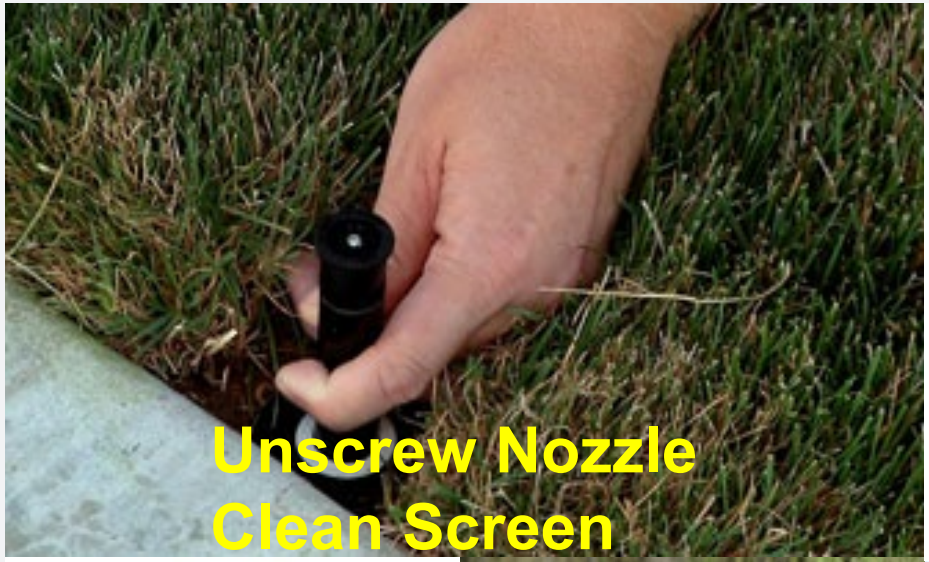
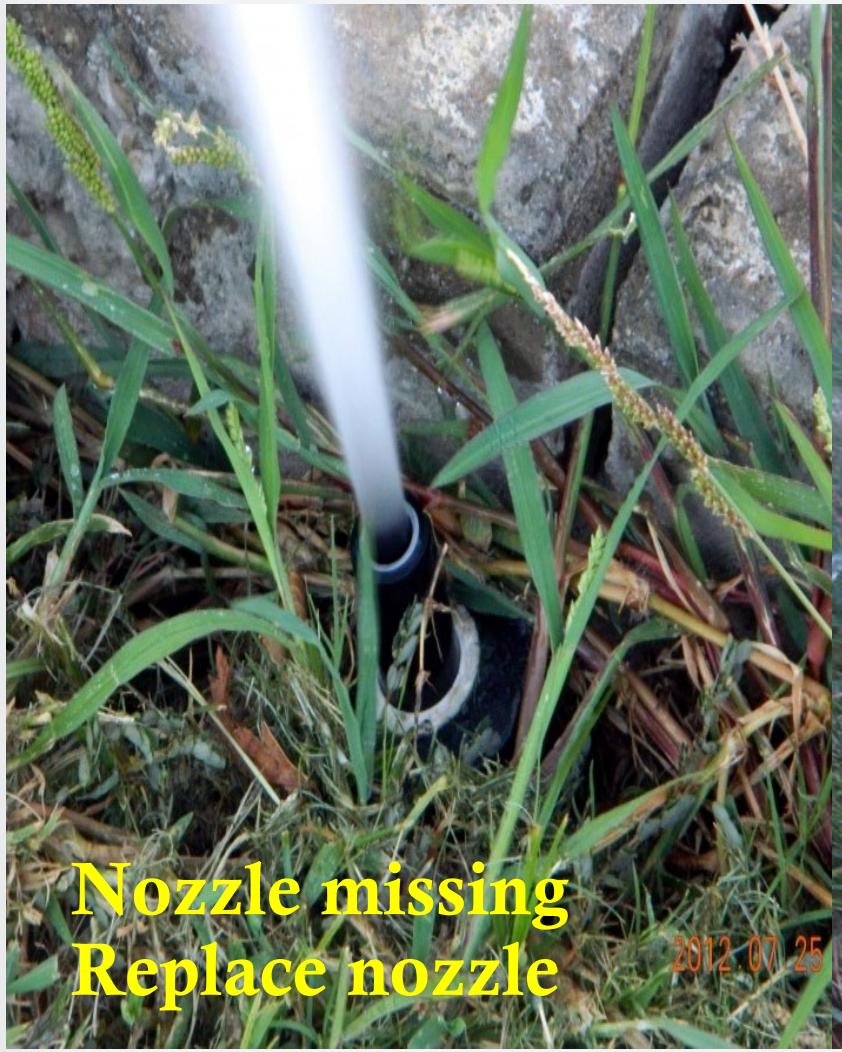
Root Rot - Phytophthora - Fungus

Irrigation Repair

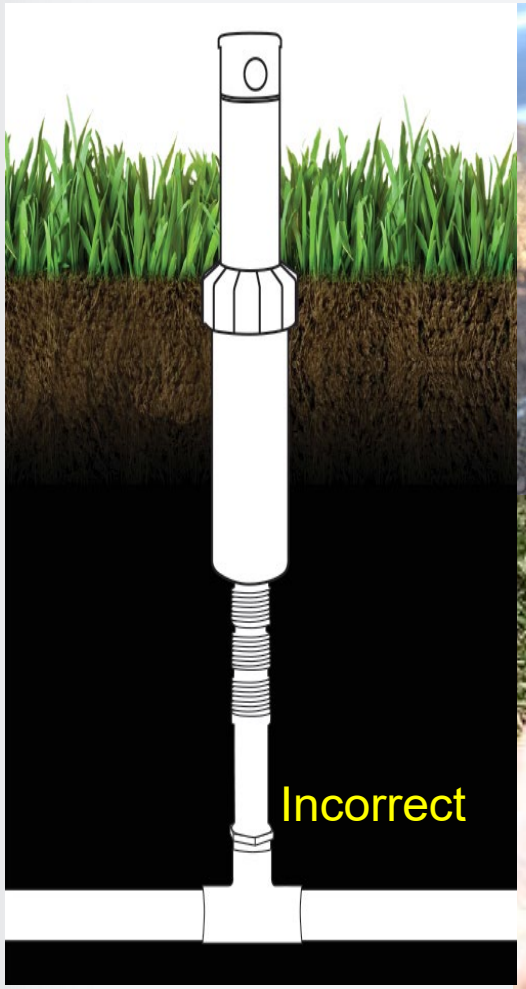
Cleaning the Nozzle and Screen

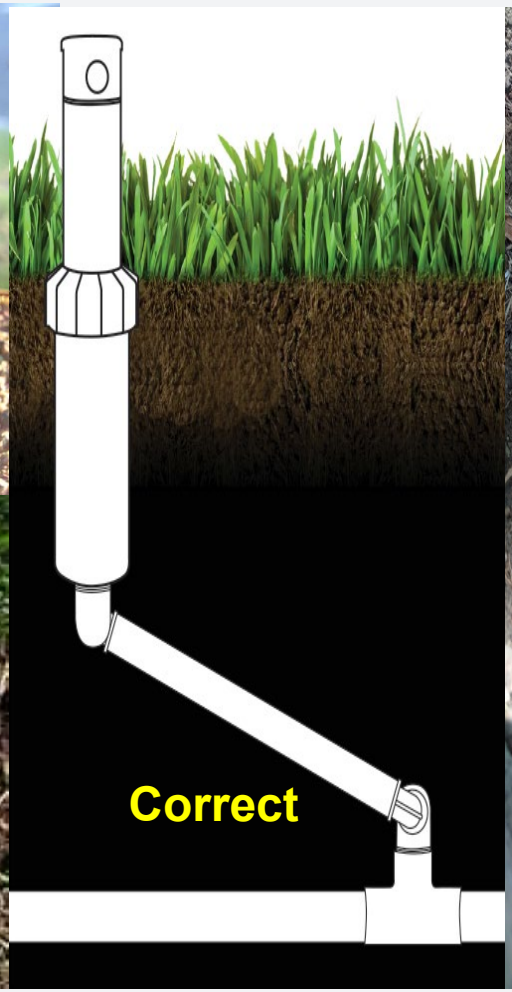


Missing Nozzle



Broken Riser

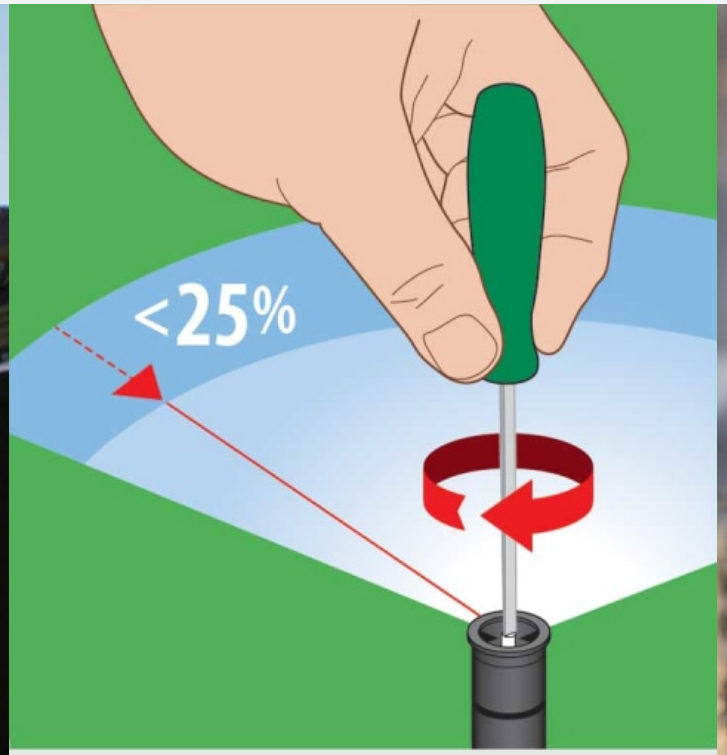




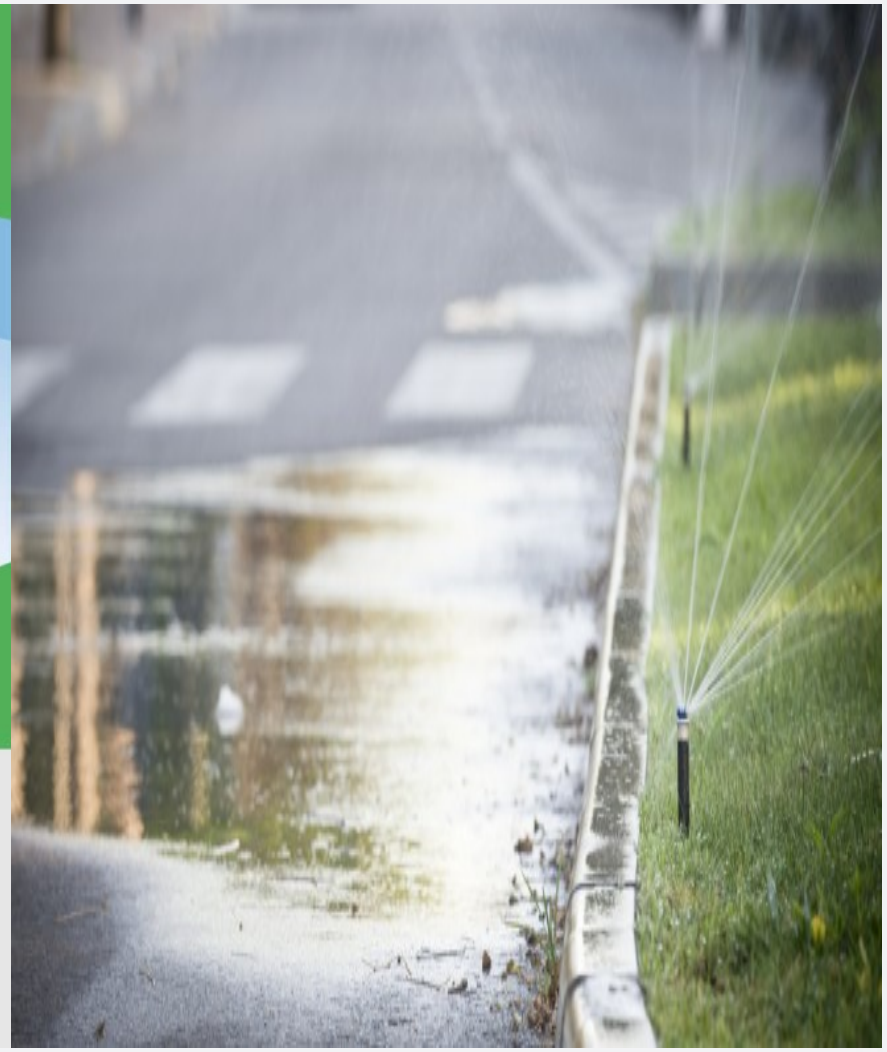
Broken Sprinkler Body

Dig up head, unscrew it, replace it with a new one

Over Spray



Water Pressure	Spray Distance	Flow Rate GPM
15 psi	8'–11'	1.30
20 psi	9'–12'	1.50
25 psi	11'–14'	1.65
30+ psi	12'–15'	1.85



Seeping Irrigation Valve

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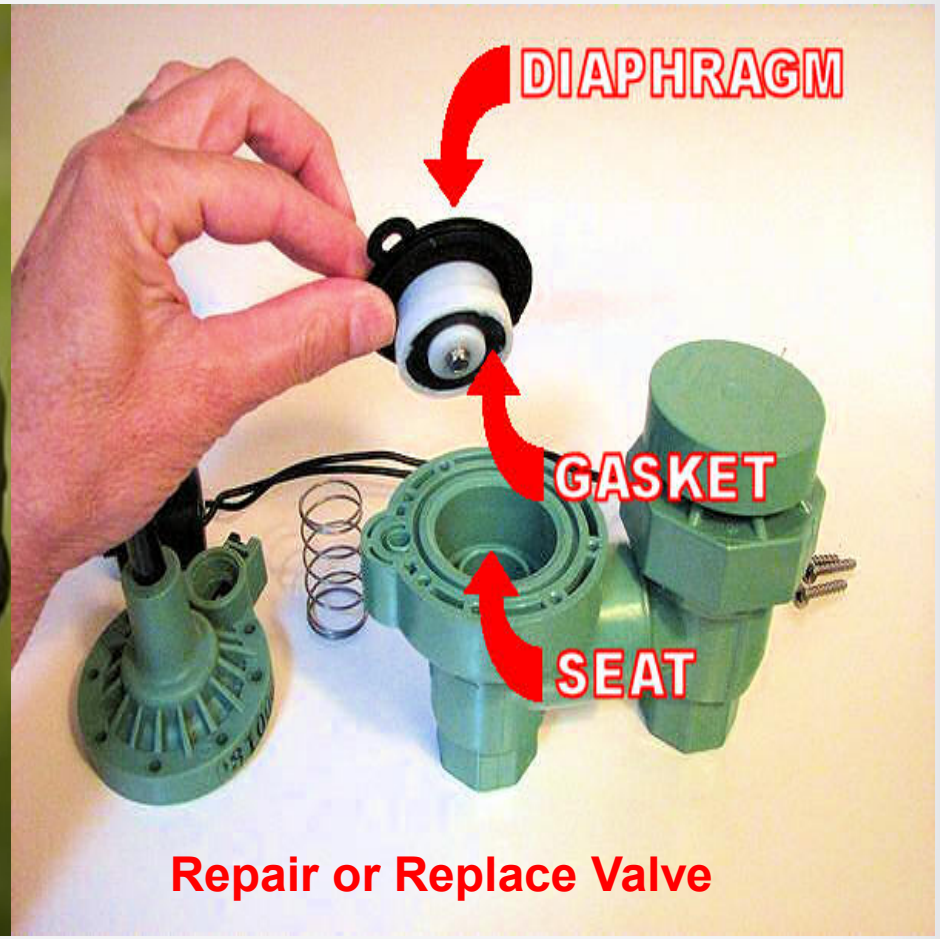
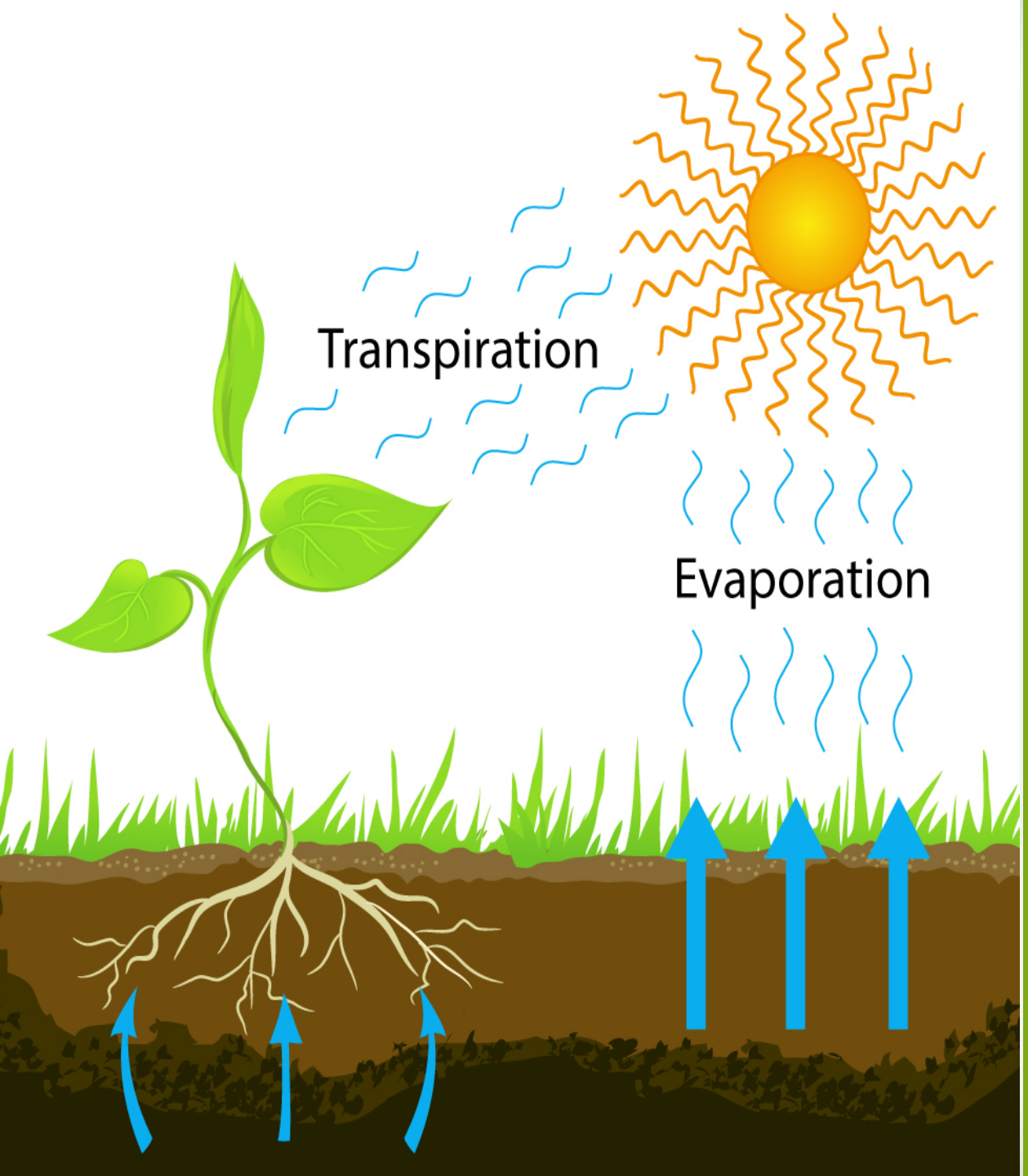


Tilted or Leaning Sprinkler Heads

Pressure Problems

OR



Evapotranspiration

The combined water use from both evaporation and transpiration of a particular plant (or crop) during a period of time.

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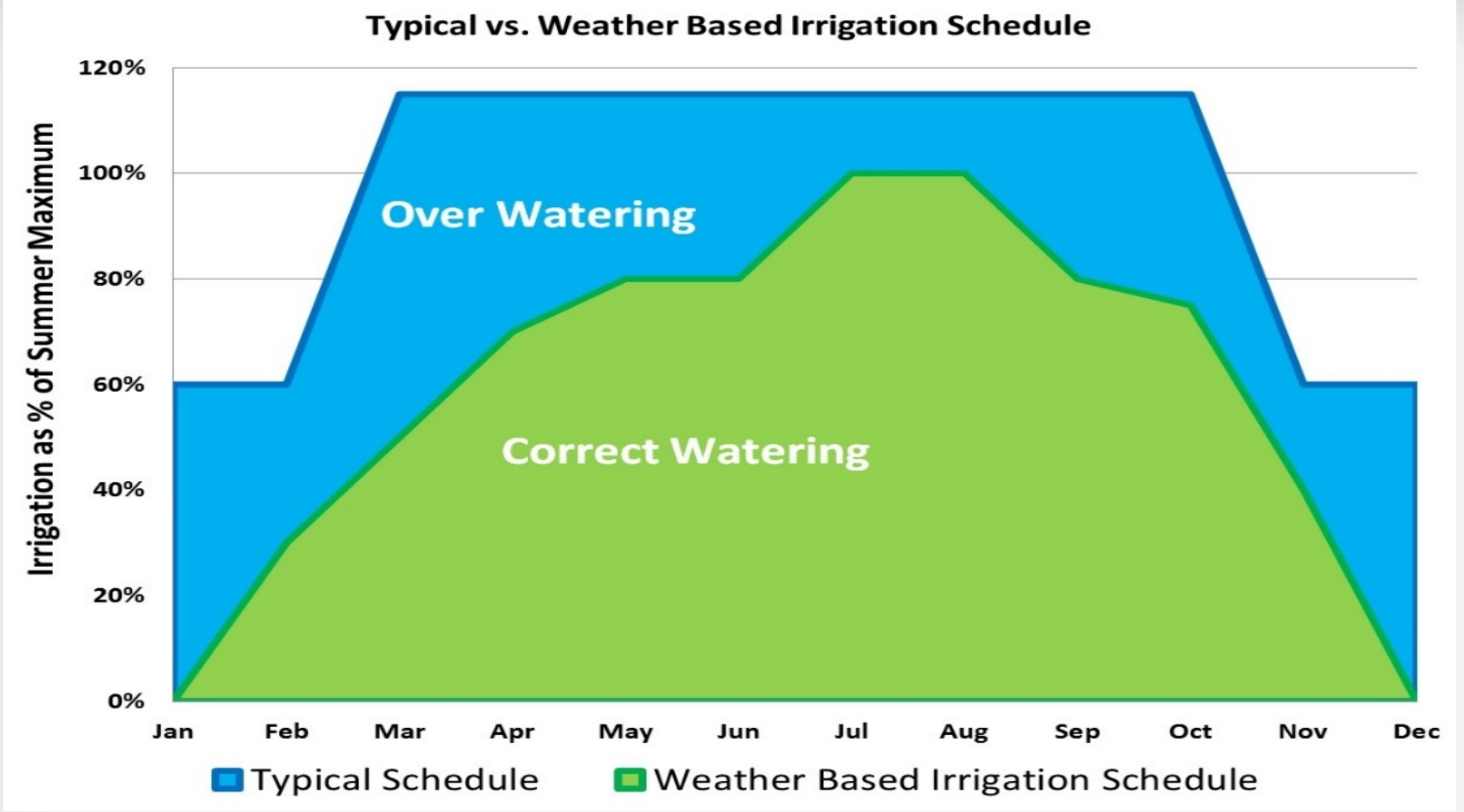
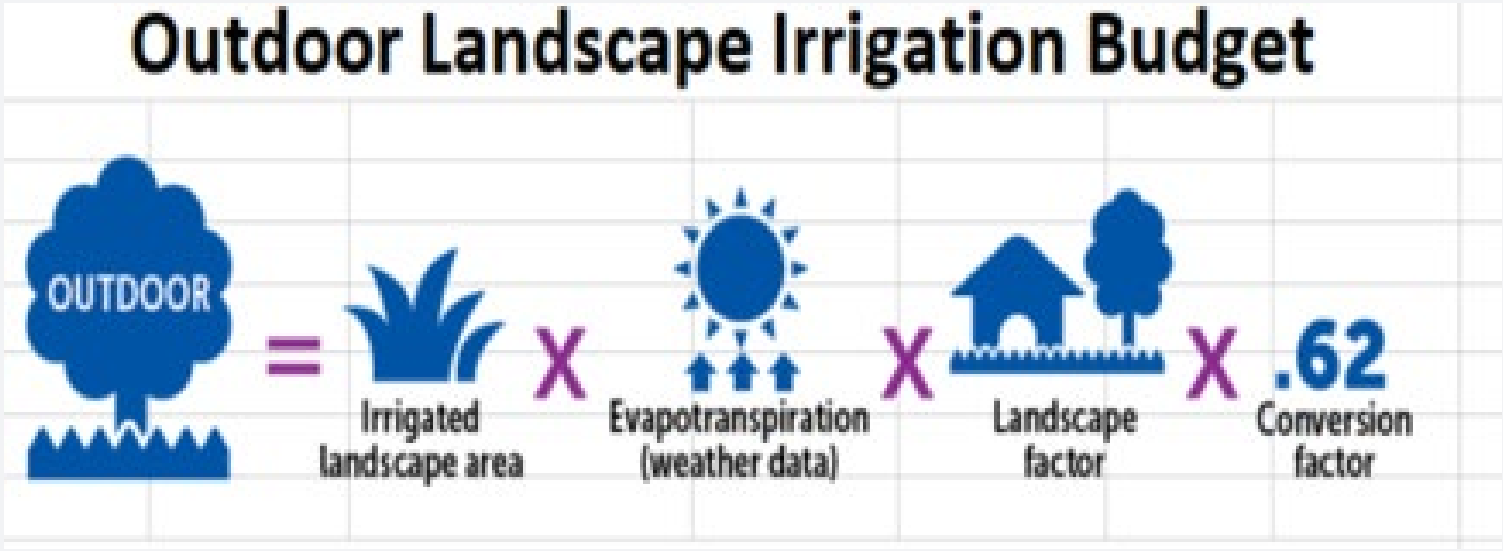
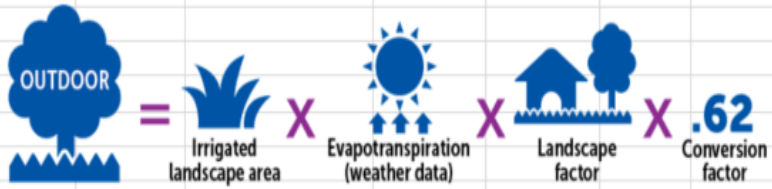

Typical vs. Weather Based Irrigation Schedule
Irrigation as % of Summer Maximum
120%
100%
80%
60%
40%
20%
0%
Over Watering
Correct Watering
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Typical Schedule
Weather Based Irrigation Schedule

Roseville's Water Budget Calculator



Outdoor Landscape Irrigation Budget



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ETo Calculator

Month	Irrigated landscape area	Evapotranspiration (weather data) ETo	Landscape Factor	Conversion Factor	Gallons of Water	Cubic Feet of Water
Jan	3,000	1.55	0.8	0.62	2,306	308
Feb	3,000	2.24	0.8	0.62	3,333	446
Mar	3,000	3.72	0.8	0.62	5,535	740
Apr	3,000	5.10	0.8	0.62	7,589	1,015
May	3,000	6.82	0.8	0.62	10,148	1,357
Jun	3,000	7.80	0.8	0.62	11,606	1,552
Jul	3,000	8.68	0.8	0.62	12,916	1,727
Aug	3,000	7.75	0.8	0.62	11,532	1,542
Sep	3,000	5.70	0.8	0.62	8,482	1,134
Oct	3,000	4.03	0.8	0.62	5,997	802
Nov	3,000	2.10	0.8	0.62	3,125	418
Dec	3,000	1.55	0.8	0.62	2,306	308
			Annual Totals		84,876	11,347

Select Month Performing Test

Monthly Flow Calculator

Month:	Jul								
Station	Location / Description	Test Run Time (Minutes)	Meter Read (Start) (CF)	Meter Read (End) (CF)	Flow Rate (CFM)	FLOW RATE (GPM)	Zone Run Time per Week (minutes)	Gallons per Station per Month	Cubic Feet per Month
1	Front Turf (spray)	1	233567.00	233572.00	5	37.4	5	748	100
2	Side Turf (spray)	1	233572.00	233579.00	7	52.36	5	1,047	140
3	Front Shrubs (Drip)	1	233579.00	233585.00	6	44.88	5	898	120
4	Front Trees (Drip)	1	233585.00	233596.00	11	82.28	5	1,646	220
5	Back Turf near Spa (Sprays)	1	233596.00	233601.00	5	37.4	5	748	100
6	Back Turf near Fence (Sprays)	1	233601.00	233614.00	13	97.24	5	1,945	260
7	Back Turf near BBQ (Sprays)	1	233614.00	233620.00	6	44.88	5	898	120
8	Back Shrubs near Fence (Drip)	1	233620.00	233629.00	9	67.32	1	269	36
9	Back Shrubs near BBQ (Drip)	1	233629.00	233635.00	6	44.88	1	180	24
10	Back Trees (Drip)	1	233635.00	233643.00	8	59.84	1	239	32
						Total Gallons / Month		8,617	
							Total CF / Month		1,152

Compare your water use to the ETo numbers

	Amount Used Gallons/Cubic Ft	Monthly ETo Calculator Gallons/Cubic Ft	Percent Difference	Over or Under Budget Gal/Cubic Ft	
Gallons	8,617	12916	-33%	-4,299	Gallons
Cubic Feet	1,152	1727	-33%	-575	Cubic Feet

This chart represents evapotranspiration for Zone 14 which is accurate for Roseville, CA and described as:
Mid-Central Valley, southern Sierra Nevada, Tehachapi & High Desert Mountains, by DWR CIMIS
https://cimis.water.ca.gov/

Finding your Irrigated Area

Depending on your property you may find this answer one of several ways

- Measure (Length X Width = Area)
- Use an APN look up tool. Example 0.17 Acres X 43560 ft/ac = 7405.2 sqft (remember to minus the SQFT of the homes footprint and hardscape or non irrigated areas)
- Use google maps, right click and Measure tool

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The Water Meter

- Find your water meter box. It is often located near the sidewalk and on a left or right property line. Hint: the curb may have a W stamped in it or a blue paint dot to signify the water meter is located nearby.
- Using a screw driver to pry or meter box tool, lift the lid. Being careful not to pinch your fingers or any water utility communication wires.
- We recommend wearing protective gloves, snakes and spiders like to live in the boxes

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Reading your meter

Can you find the low flow indicator?

3 Generations of Sensus SRII Registers are shown

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From your Irrigation Controller

- Find the total number of minutes per week, for each zone.
  - Example: station 1 runs 2 times, 4 days a week for 5 minutes = 40 min per week

- Run each zone for a specified number of minutes, Minimum 1 minute. I recommend 5 minutes per zone. Record the start and stop meter reads for each zone.

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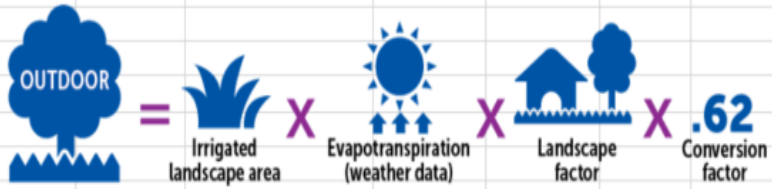
Outdoor Landscape Irrigation Budget



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Monthly Flow Calculator

Month:	Jul								
Station	Location / Description	Test Run Time (Minutes)	Meter Read (Start) (CF)	Meter Read (End) (CF)	Flow Rate (CFM)	FLOW RATE (GPM)	Zone Run Time per Week (minutes)	Gallons per Station per Month	Cubic Feet per Month
1	Front Turf (spray)	1	233567.00	233572.00	5	37.4	5	748	100
2	Side Turf (spray)	1	233572.00	233579.00	7	52.36	5	1,047	140
3	Front Shrubs (Drip)	1	233579.00	233585.00	6	44.88	5	898	120
4	Front Trees (Drip)	1	233585.00	233596.00	11	82.28	5	1,646	220
5	Back Turf near Spa (Sprays)	1	233596.00	233601.00	5	37.4	5	748	100
6	Back Turf near Fence (Sprays)	1	233601.00	233614.00	13	97.24	5	1,945	260
7	Back Turf near BBQ (Sprays)	1	233614.00	233620.00	6	44.88	5	898	120
8	Back Shrubs near Fence (Drip)	1	233620.00	233629.00	9	67.32	1	269	36
9	Back Shrubs near BBQ (Drip)	1	233629.00	233635.00	6	44.88	1	180	24
10	Back Trees (Drip)	1	233635.00	233643.00	8	59.84	1	239	32
						Total Gallons / Month		8,617	
							Total CF / Month		1,152

Compare your water use to the ETo numbers

	Amount Used Gallons/Cubic Ft	Monthly ETo Calculator Gallons/Cubic Ft	Percent Difference	Over or Under Budget Gal/Cubic Ft	
Gallons	8,617	12916	-33%	-4,299	Gallons
Cubic Feet	1,152	1727	-33%	-575	Cubic Feet

This chart represents evapotranspiration for Zone 14 which is accurate for Roseville, CA and described as:
Mid-Central Valley, southern Sierra Nevada, Tehachapi & High Desert Mountains, by DWR CIMIS
https://cimis.water.ca.gov/

Are you Over Budget?

- Scheduling (See our chart on the next page)
  - Too Long
  - Too Often
  - Not using cycle an soak – Water spent as run off
- Broken components
- Wrong Information in calculator
  - Square Footage
  - Flow Rate math errors
  - Weekly run time errors
- As with any budget – Its all in how you use it

Information - Resources

http://www.roseville.ca.us/rebates
http://www.beyondthedrought.com/info.php
https://ucanr.edu/sites/WUCOLS/
https://www.irrigationtutorials.com/
https://bewatersmart.info/
http://www.saveourwaterrebates.com/turf-replacement-rebates.html

Local Irrigation Supply Centers

Horizon Distributors 861 Galleria Blvd, Roseville

Ewing Irrigation & Landscape Supply 500 Berry St b, Roseville

Site One 1675 Nichols Dr Rocklin

Roseville Water Wise House Calls

Why struggle with your irrigation?

Call us!

- Call us to schedule an appointment. Our water-use specialists can come to your home and analyze your indoor and outdoor water use, including checking your sprinklers.
- House Calls are free to Roseville residents and are available weekdays to suit your schedule.
- Call (**916) 774-5761** to schedule your appointment today.

CITY OF ROSEVILLE CALIFORNIA