
EWING®
Irrigation & Landscape Supply

Giving Smart Irrigation a Chance

(Prerequisites for Initial and Ongoing Success)

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Ewing Irrigation and Landscape Supply

Private Residence - 2007
Hillsborough, California

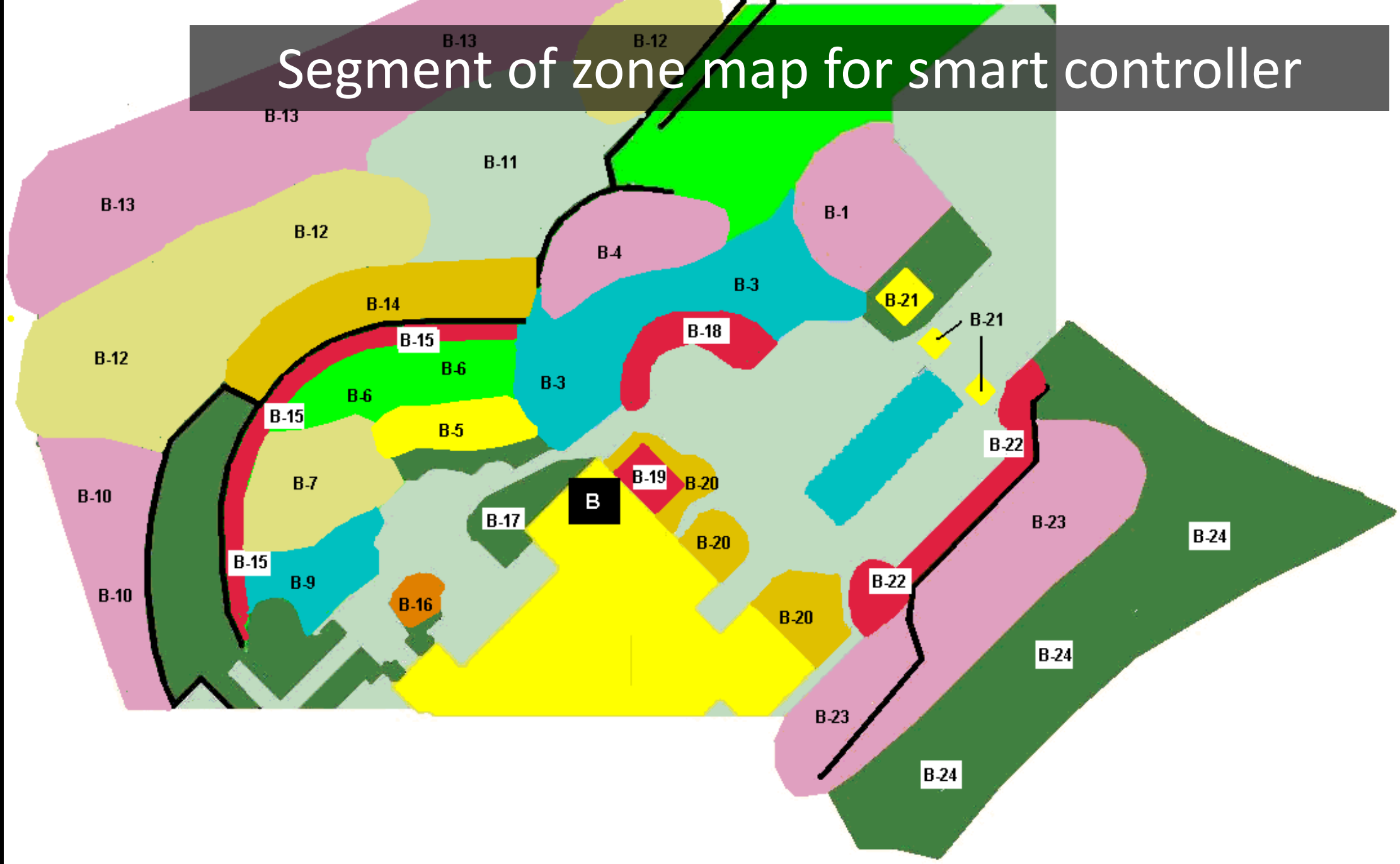

Step 1

Irrigation Audit, $7500 billed

Step 2: Retrofit projects resulting from audit savings

Inventory and map hydrozones

Segment of zone map for smart controller



Overview

- Initial Audit Cost - $7,500 – 36 hours labor
- Savings on first water bill $10,000
  - Billing is monthly
  - Savings came from audit tune up
  - Audit itself turned a profit in one month

(This scenario also had expensive water)

Overview (continued)

- Replaced 4 existing controllers with smart controllers
  - Labor charge $1,500 per controller (did not include equipment cost)
  - Populated controllers with site information from site audits
- Retrofitted 900 of the 15ft spray nozzles
  - MP2000 rotary nozzles
  - Labor charge $20 per nozzle (did not include cost of nozzles)

Claremont Greens HOA
Portland, Oregon


CLAREMONT
GREENS

Details

- 4.07 Acres
- 18 hole-putting course
- 17 signature water features
- Turf:
  - Lawn – 93,450 square feet
  - Greens – 16,707 square feet
- Planting beds: 67, 360 square feet

Enhancements

2010 Controller upgrades – $3805.00

- 32 Station ESP LX Modular w/ ET Manager
  - Common areas
  - Consolidate / replace 2 standard controllers
- Replaced front and back 9 controllers
  - ESP LX Modular w / ET Manager

Enhancements (continued)

2011 Sprinkler upgrade – $11,241.00

Objectives:

1. Efficiency
2. Reduce system flow
3. Allowed 2 controllers to operate simultaneously

- Retrofit sprinklers that water the 18 greens
- Hunter MPR40 (now PRS40) bodies
- MP Rotator nozzles

Results

- Reduction in average annual water use:
  - 2007 – 2009: 4,151,400 gallons (5,550 billing units)
  - 2010 – 2016: 2,769,024 gallons (3,738 billing units)
  - 33% reduction

  - This represents a $ 37,265 water cost savings over the seven years
  - (Much cheaper water than in the first example)

Results

- Ongoing business
  - $35,000 small lawns to bed conversion
  - Regular landscape maintenance

- Aesthetics
  - Merit Award from PLANET (2011)
  - Claremont Greens HOA and Willamette Landscape Services

Ready for Smart Control?

How does good standard irrigation differ from “Smart” irrigation?

Standards, codes and best management practices directly impact the way irrigation systems are designed, installed and operated. IA works hard to make sure the industry has a say in its future.

STANDARDS

Landscape Irrigation BMPs

SWAT

Standards

Landscape Irrigation Best Management Practices

Together with recognized irrigation experts, the Irrigation Association has developed best management practices for turf and landscape. These BMPs are designed to:

- Raise the bar for efficient water management.
- Preserve water supplies and protect water quality.
- Help stakeholders formulate and implement sound water policies, including appropriate codes and standards for effective water stewardship.
- Help water purveyors, industry professionals and irrigation consumers make responsible and informed decisions about water use.

Each BMP includes a corresponding practice guideline that provides a template to establish specifications that address local needs. Practice guidelines are based on proven scientific and engineering principles.

2014 Landscape Irrigation Best Management Practices

The development of Landscape Irrigation Best Management Practices was a collaborative effort between the Irrigation Association and the American Society of Irrigation Consultants to update and revise the original document, Turf and Landscape Irrigation Best Management Practices, originally published in 2002 and republished with minor revisions in 2005 and 2010.

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The updated document identifies three best management practices for landscape irrigation.

- Design the irrigation system to efficiently use water resources.
- Install the irrigation system to meet the design criteria.
- Manage landscape water resources to maintain a healthy and functional landscape.

The document also contains information in the appendix to provide further information about water budgeting, scheduling and procedures to inspect and commission an irrigation system.

Contact IA Industry Development Director Brent Q. Mecham, CID, CLWM, CIC, CAIS, with any questions.

Download the 2014 Landscape Irrigation Best Management Practices.

EPA WaterSense Label

- Non-volatile memory
- Zone by zone control
- Accommodates rain sensors
- Accommodates water restrictions
- Water budget feature
- “Smart-mode”return after manual water

SWAT Testing

- Historical ET data
- Onsite ET sensor
- Paged remote weather station data
- Onsite temperature and rain sensors
- Add-ons to existing, standard controllers

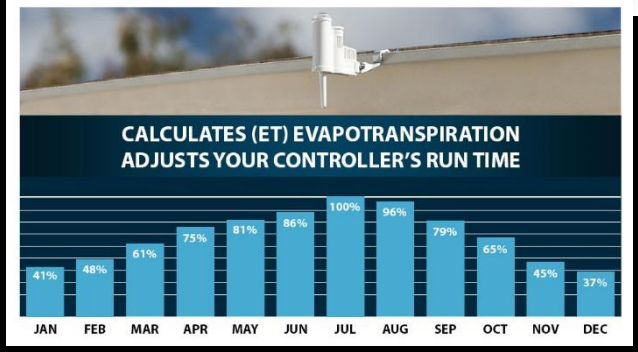
Objectives for “standard” irrigation

- Appropriate precipitation rates for site soils
- Pressure regulation as needed
- Adequate pressure and flow to the “critical head”
- Head / emitter layout per manufacturer’s specification
- Evapotranspiration-based scheduling
- Seasonal adjustment
- Avoid runoff and deep percolation

“Smart” irrigation objectives:

- All standard objectives listed above
- Controller creates or modifies schedule automatically
  - Evapotranspiration
  - Soil moisture data

- Smart irrigation
  - Consistent
  - Monitors for change
  - Responds to change
  - WITH THE CORRECT INPUTS…


CALCULATES (ET) EVAPOTRANSPIRATION
ADJUSTS YOUR CONTROLLER'S RUN TIME
41%
48%
61%
75%
81%
86%
100%
96%
79%
65%
45%
37%
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC


ET2000e
CONTROLLER

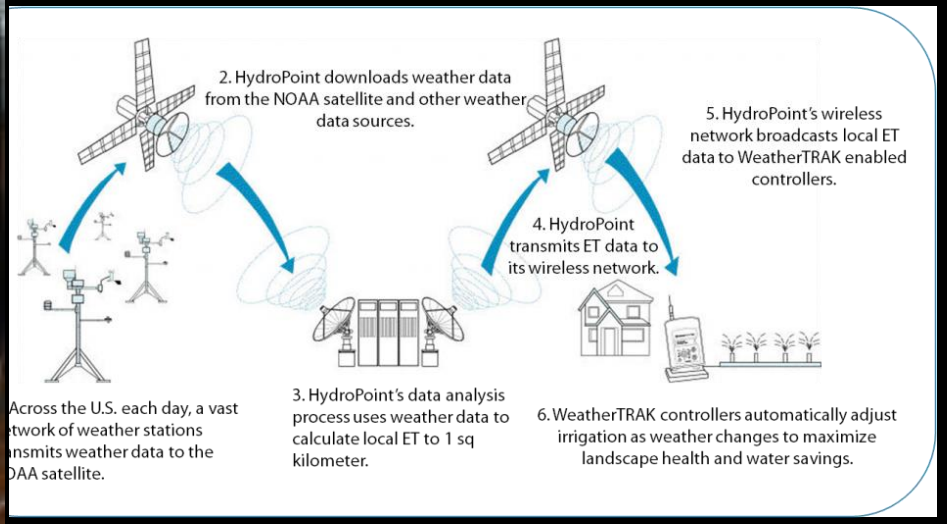

TOTAL CONTROL
Irritrol
12 STATIONS
CLIMATELOGIC
No Rain - Irrigation
CL-M1


ESP-LXD


ETC-LX
RESET
RS232
RAIN BIRD


ET Manager
RAIN BIRD


ETwater
www.etwater.com


2. HydroPoint downloads weather data from the NOAA satellite and other weather data sources.
5. HydroPoint's wireless network broadcasts local ET data to WeatherTRAK enabled controllers.
4. HydroPoint transmits ET data to its wireless network.
Across the U.S. each day, a vast etwork of weather stations ansmits weather data to the OAA satellite.
3. HydroPoint's data analysis process uses weather data to calculate local ET to 1 sq kilometer.
6. WeatherTRAK controllers automatically adjust irrigation as weather changes to maximize landscape health and water savings.


TORO
0124


BASE·LINE
Made In The USA


TORO


ECHO-10
ECHO-10
ECHO-10


ECHO

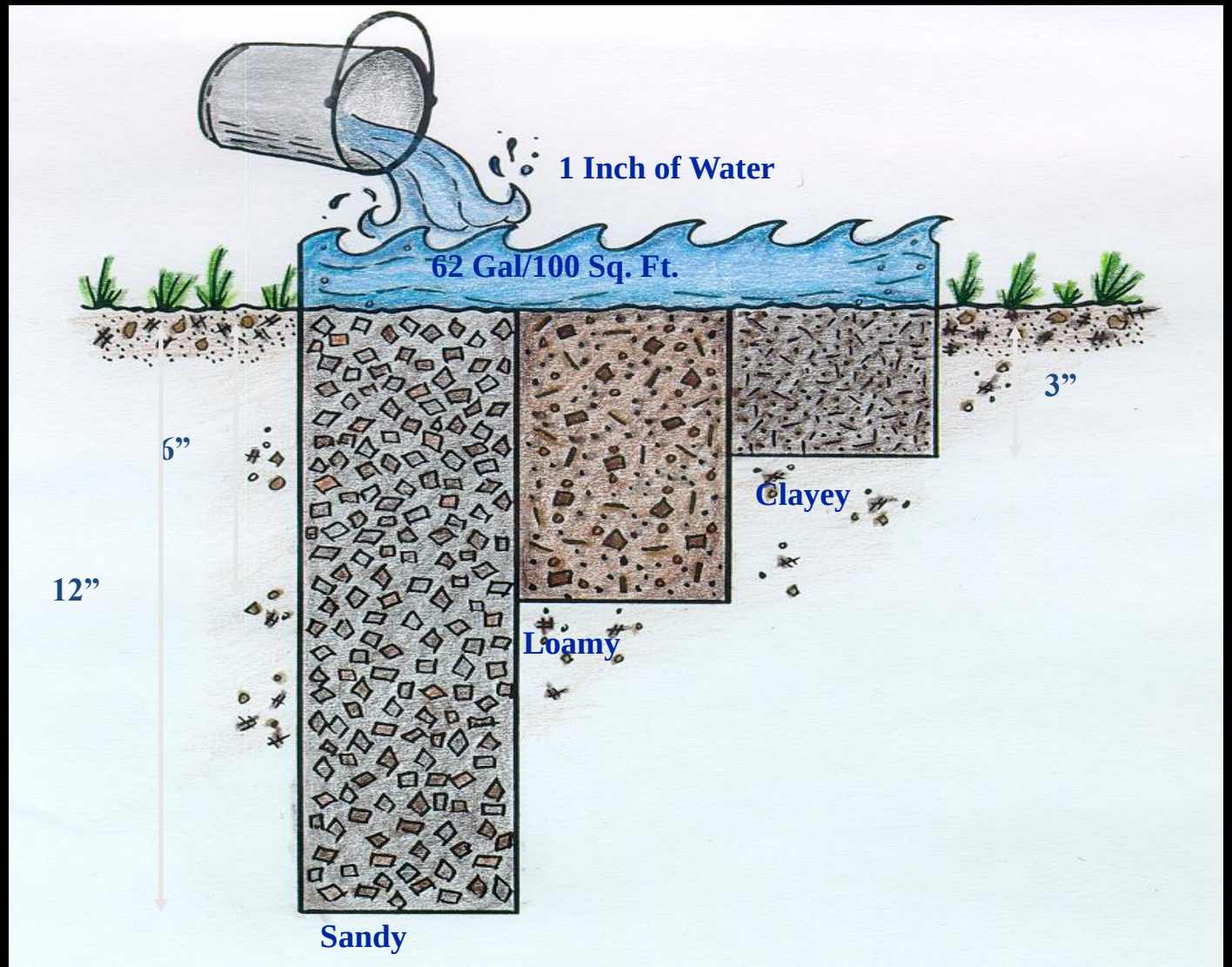
Hydrozones / Microclimates


TOMBLESON


Grant Road
INDUSTRIAL CENTER

Soil

The Plant-Soil-Water Relationship



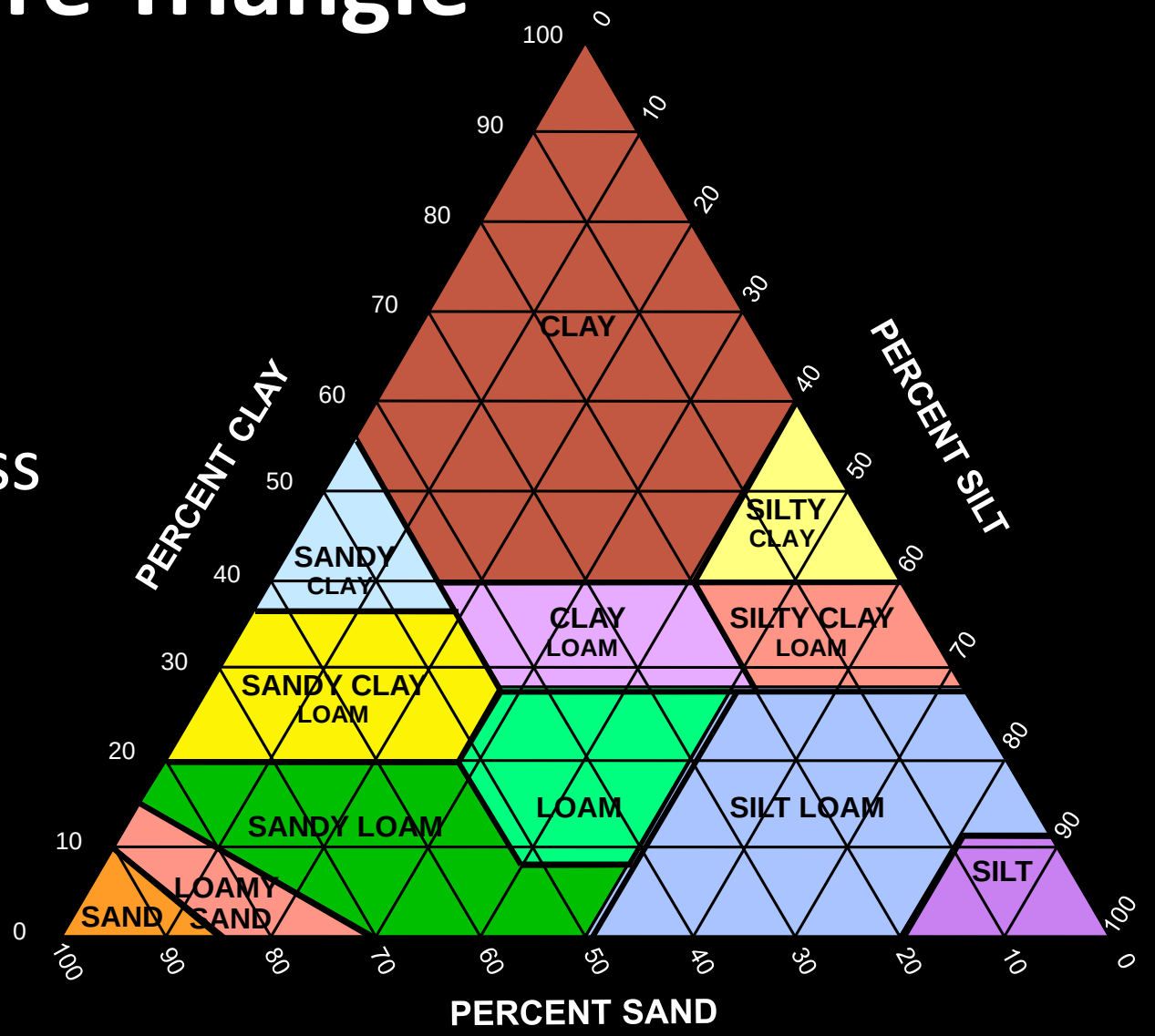
How Deep?
…are the roots?

How Deep?
…does 1″ of water move down in your soil?

How Long?
…does your system need to run to deliver 1″ of water?

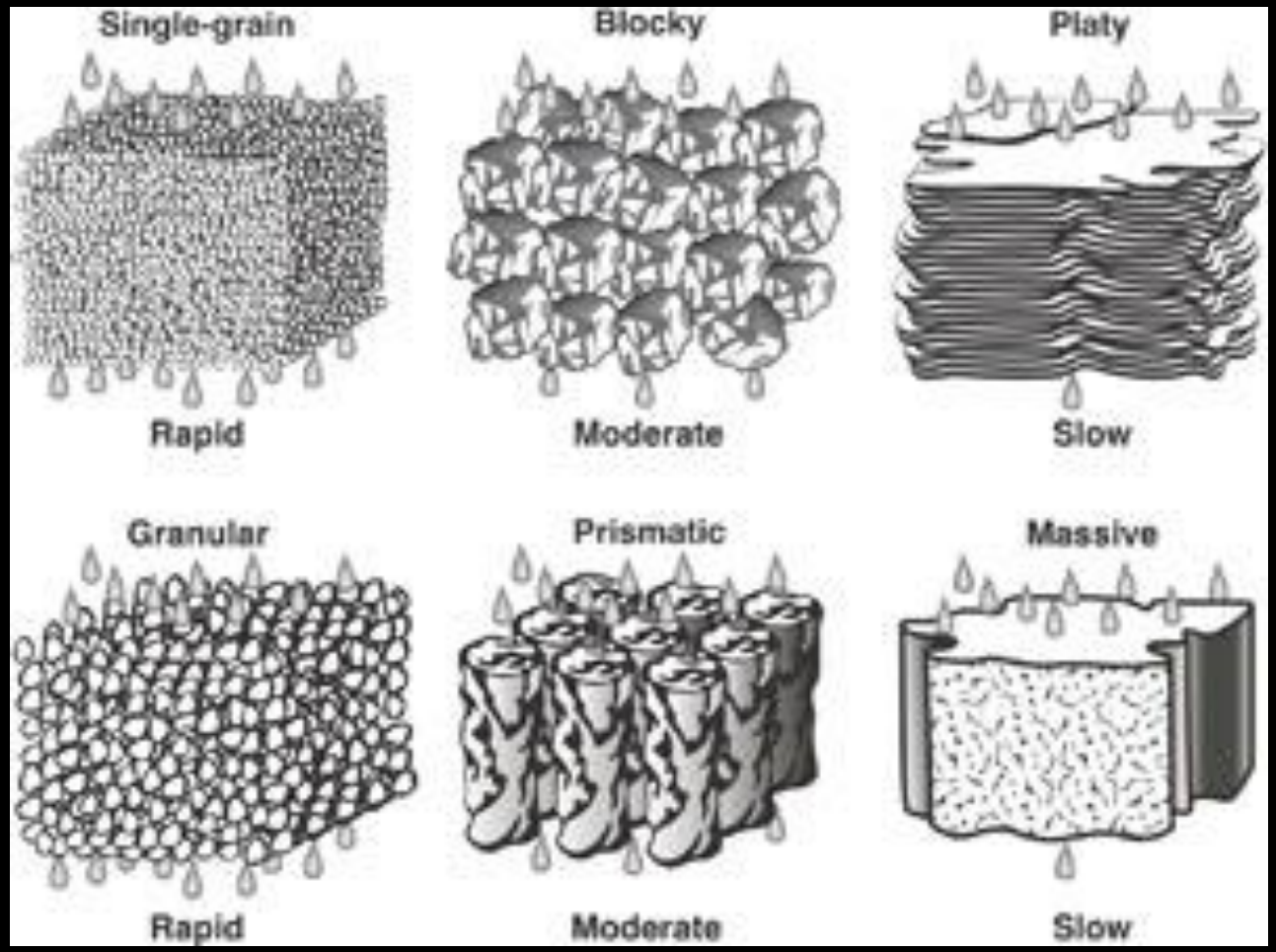
Soil Texture Triangle

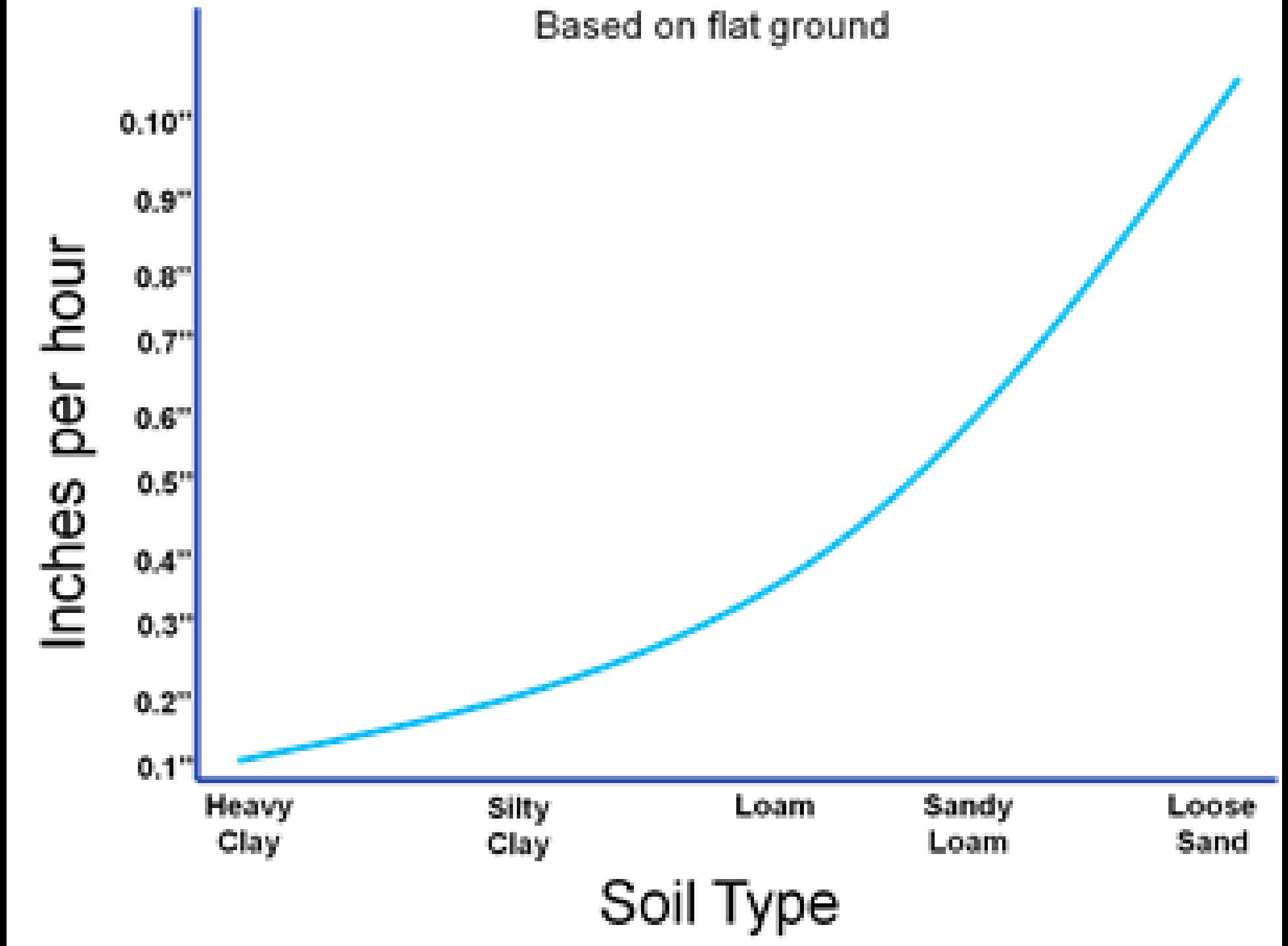
- Soil test (around $50.00)
- More accurate than a mason jar
- Water holding capacity
- More important than texture class

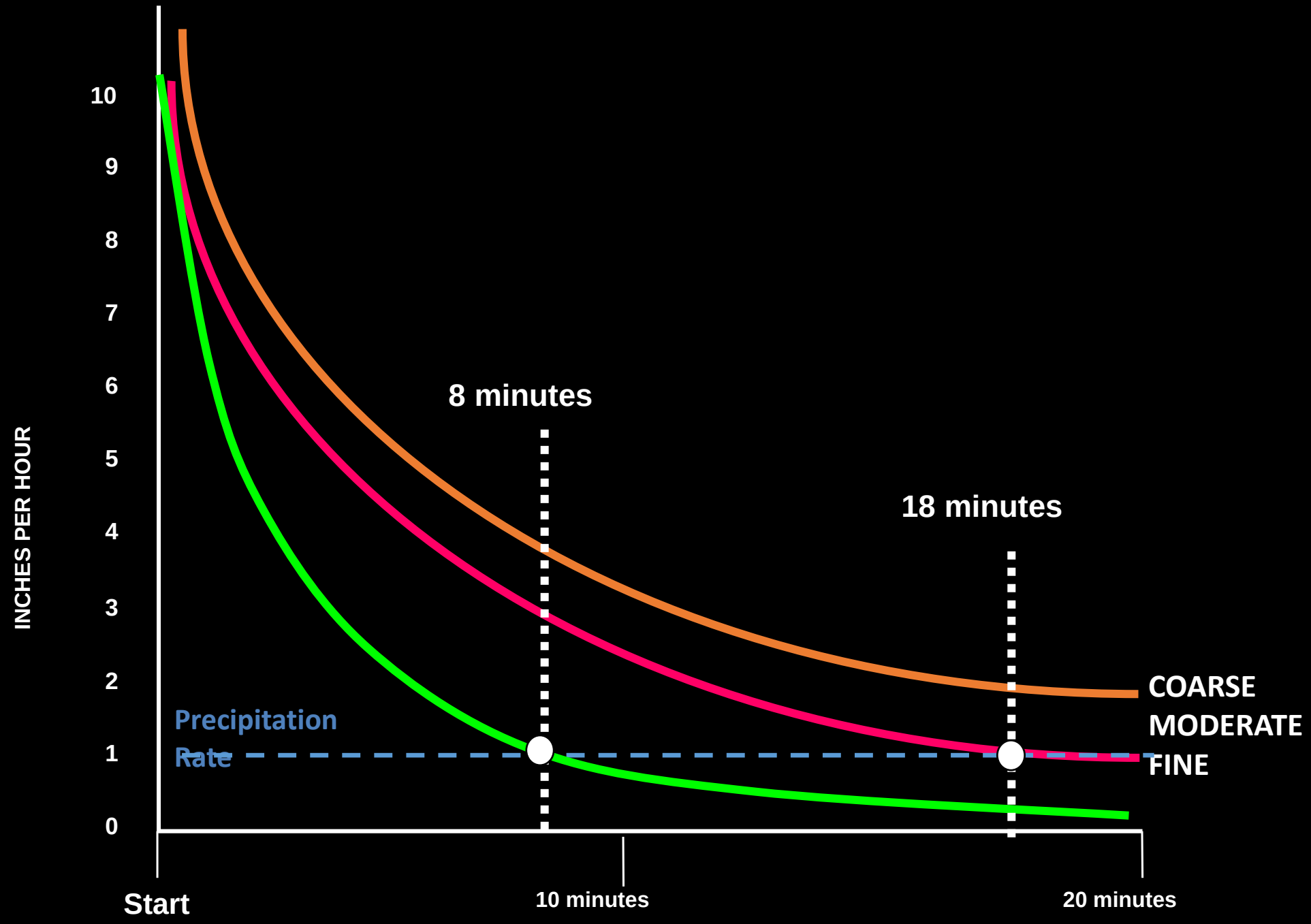


Soil Structure

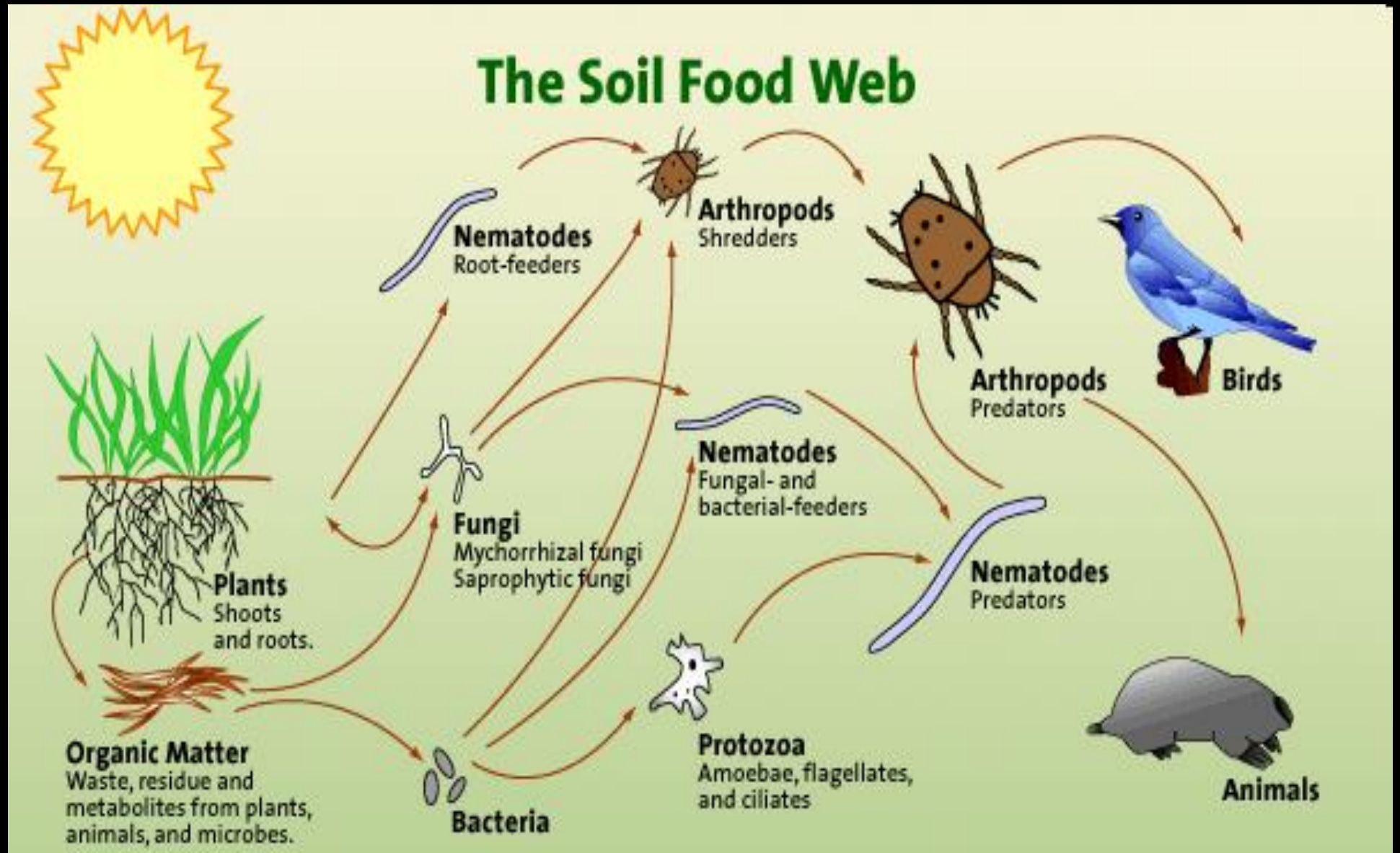
particles of sand, silt, and clay grouped into larger aggregates of various sizes and shapes



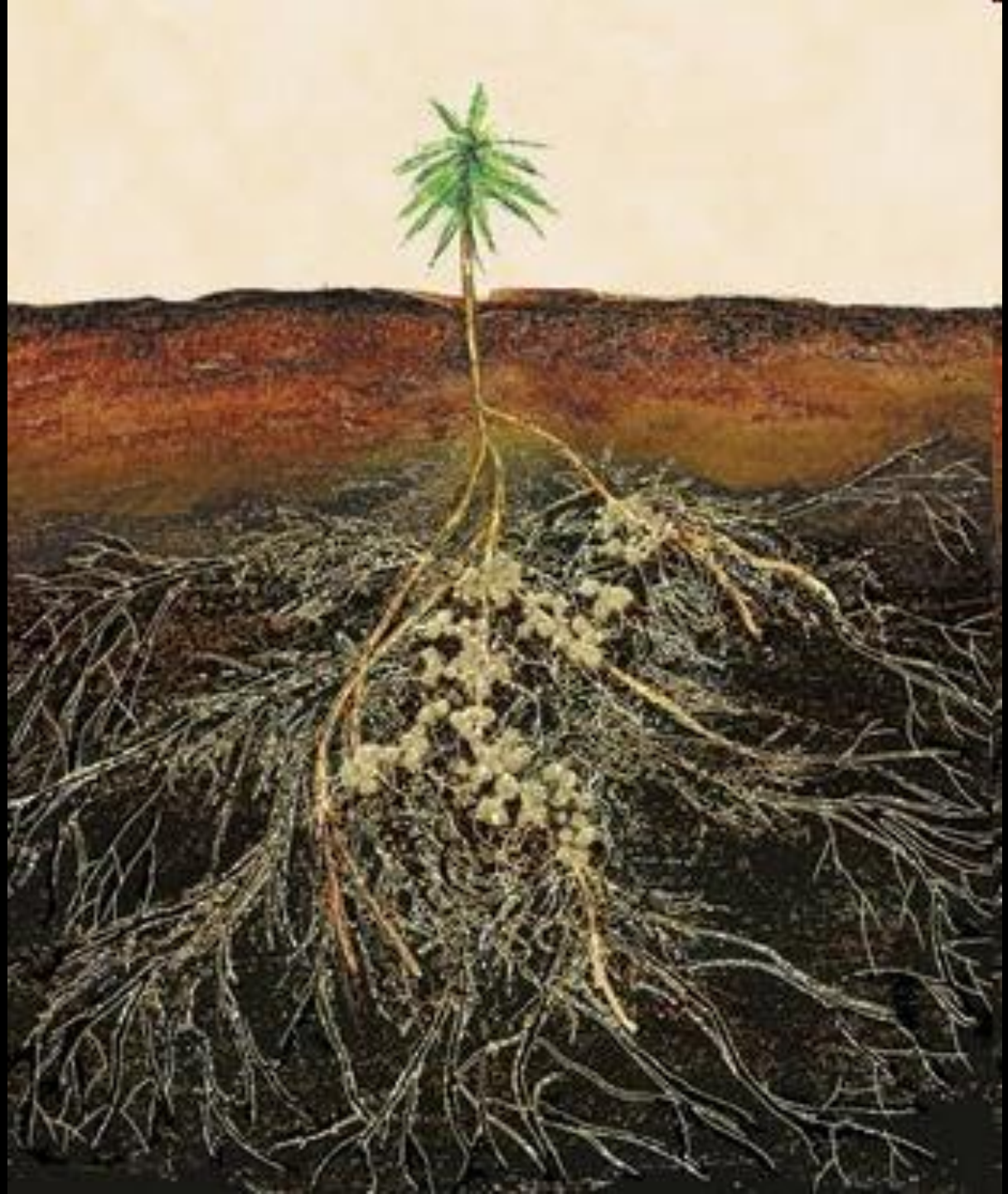

Based on flat ground
Inches per hour
0.10"
0.9"
0.8"
0.7"
0.6"
0.5"
0.4"
0.3"
0.2"
0.1"
Heavy Clay
Silty Clay
Loam
Sandy Loam
Loose Sand
Soil Type


INCHES PER HOUR
10
9
8
7
6
5
4
3
2
1
0
8 minutes
18 minutes
Precipitation Rate
COARSE
MODERATE
FINE
Start
10 minutes
20 minutes

The Soil Food Web



First trophic level:	Second trophic level:	Third trophic level:	Fourth trophic level:	Fifth & higher trophic level:
Photosynthesizers	Decomposing Mutualists Pathogens, Parasites Root-feeders	Shredders Predators Grazers	Higher level predators	Higher level predators



Slope

Head Choice

Fixed Sprays

- 5-17’ radius
- Matched precipitation rate (mostly)
- Relatively large orifice
- Few moveable parts
- High precipitation rate 1-2+ in/hr
- VAN nozzles to over 10 in/hr
- Useful for short water windows
- Prone to runoff on tight soils
- Multiple cycles per water day

Multi-stream-multi-trajectory nozzles

- 11-35’ standard radii (plus special)
- Matched precipitation rate
- Sensitive to water quality
- Moving parts
- Low precipitation rate (.37 - .80”/hr)
- Useful on tight soils and slopes
- Longer runtime before runoff
- Longer water window necessary

Single stream rotor

- Up to 100’ radius
- MPR must be designed for
- Can be sensitive to water quality
- Moving parts
- Lower PR usually (.4 - .1”/hr)
- Useful in large areas
- Longer runtime before runoff
- Longer water window necessary
- Must know pressure!

Drip/Micro

- Point or Line source
- Widely ranging PR by design
- Matched PR not a given
- Pressure sensitive esp. CV emitters
- Filtration and pressure regulation
- Often unrestricted in use
- Adaptable to multiple soil types
- Requires regular maintenance
- (what doesn’t?)

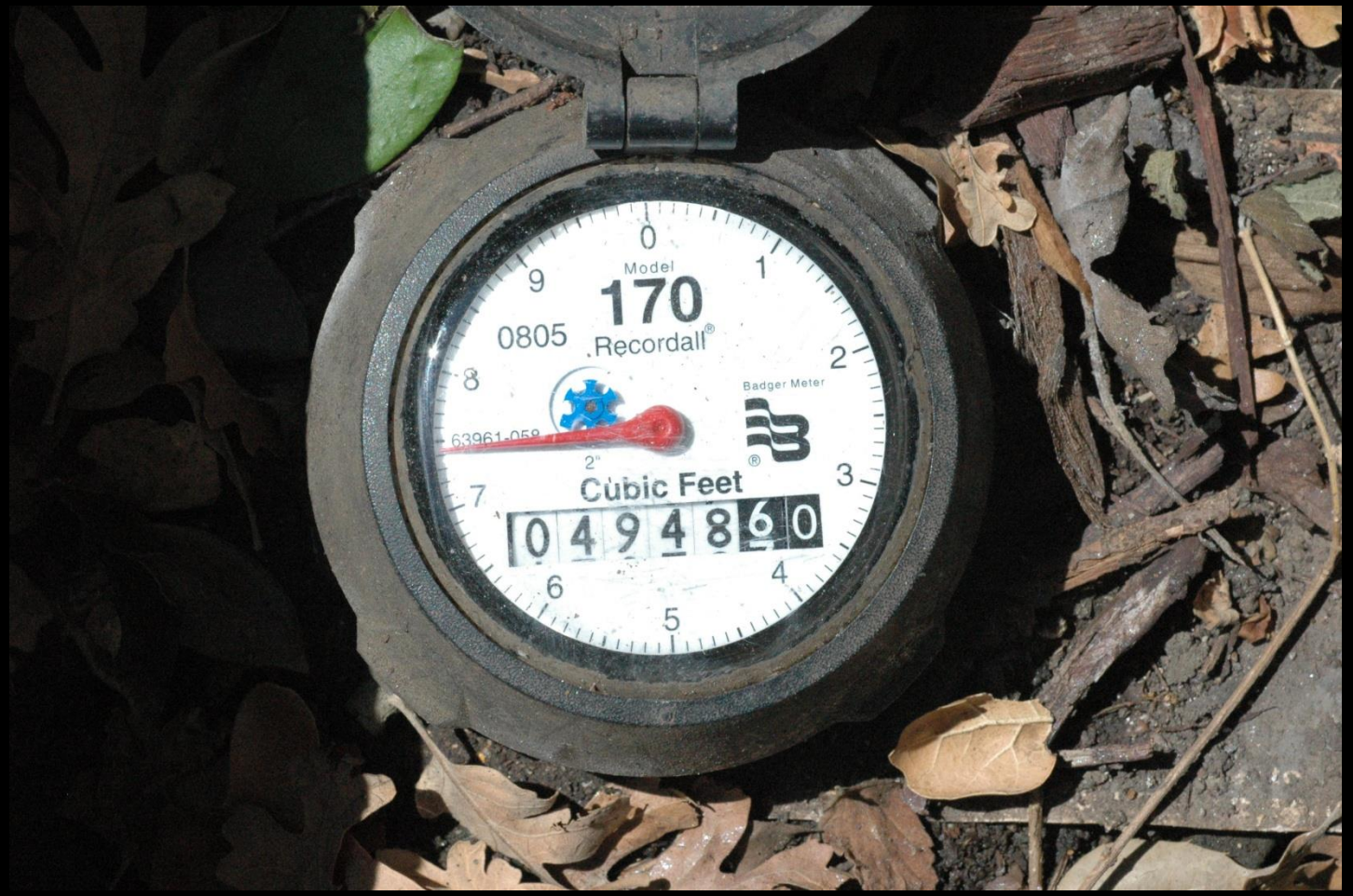
Bubbler

- .25 to 2 GPM
- Deep root .25 and .5 GPM
- For tree wells or planters
- Relatively large orifice
- Gal. per plant per day (not PR)
- Shorter runtime with soak
- Requires containment
- Can easily overwater
- Requires separate zone!

Irrigation water source and zones

- Zone flows appropriate to meter size
- Components sized per manufacturer’s specifications
- Pipes sized to keep velocities below 5 fps
- Pressure difference between first and last head is less than 10 %
- Pressure is regulated or boosted (pump) as required

Point of Connection: Meter



Point of Connection: Meter

PRESSURE LOSS THROUGH WATER METERS
AWWA STANDARD
PRESSURE LOSS: (PSI)

FLOW G.P.M.	NORMAL SIZE							FLOW G.P.M.
	5/8	3/4	1	1 1/2	2	3	4	
1	0.2	0.1						1
2	0.3	0.2						2
3	0.4	0.3						3
4	0.6	0.5	0.1					4
5	0.9	0.6	0.2					5
6	1.3	0.7	0.3					6
7	1.8	0.8	0.4					7
8	2.3	1.0	0.5					8
9	3.0	1.3	0.6					9
10	3.7	1.6	0.7					10
11	4.4	1.9	0.8					11
12	5.1	2.2	0.9					12
13	6.1	2.6	1.0					13
14	7.2	3.1	1.1					14
15	8.3	3.6	1.2					15
16	9.4	4.1	1.4	0.4				16
17	10.7	4.6	1.6	0.5				17
18	12.0	5.2	1.8	0.6				18
19	13.4	5.8	2.0	0.7				19
20	15.0	6.5	2.2	0.8				20
22		7.9	2.8	1.0				22
24		9.5	3.4	1.2				24
26		11.2	4.0	1.4				26
28		13.0	4.6	1.6				28
30		15.0	5.3	1.8	0.7			30
32			6.0	2.1	0.8			32
34			6.9	2.4	0.9			34
36			7.8	2.7	1.0			36
38			8.7	3.0	1.2			38
40			9.6	3.3	1.3			40
42			10.6	3.6	1.4			42
44			11.7	3.9	1.5			44
46			12.8	4.2	1.6			46
48			13.9	4.5	1.7			48
50			15.0	4.9	1.9	0.7		50
52				5.3	2.1			52
54				5.7	2.2			54
56				6.2	2.3			56
58				6.7	2.5			58
60				7.2	2.7	1.0		60
65				8.3	3.2	1.1		65
70				9.8	3.7	1.3		70
75				11.3	4.3	1.5		75
80				12.8	4.9	1.6	0.7	80
90				16.1	6.2	2.0	0.8	90
100				20.0	7.8	2.5	0.9	100
110					9.5	2.9	1.0	110
120					11.3	3.4	1.2	120
130					13.0	3.9	1.4	130

PRESSURE LOSS THROUGH WATER METERS
AWWA STANDARD
PRESSURE LOSS: (PSI)

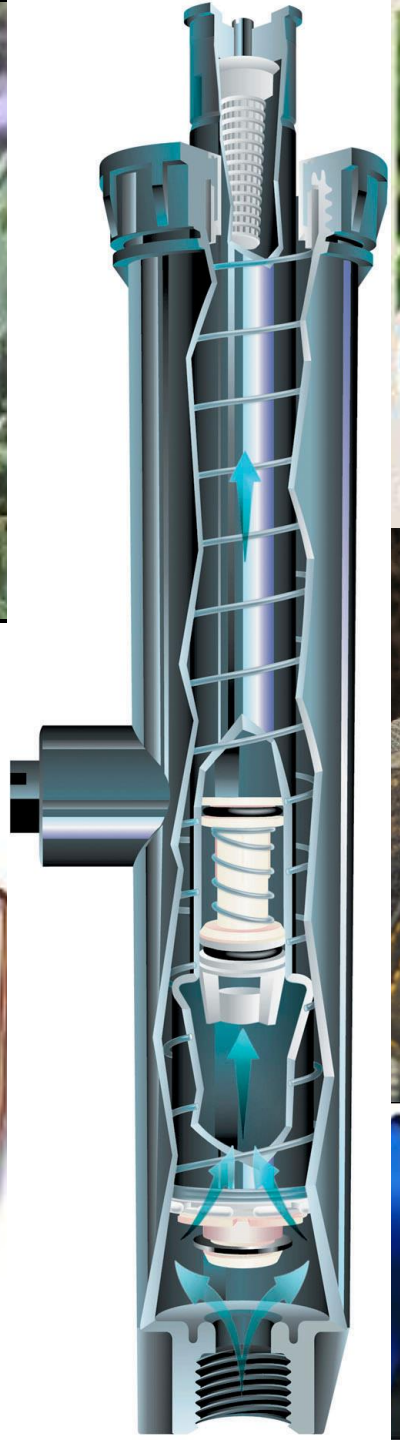
FLOW G.P.M.	NORMAL SIZE							FLOW G.P.M.
	5/8	3/4	1	1 1/2	2	3	4	
1	0.2	0.1						1
2	0.3	0.2						2
3	0.4	0.3						3
4	0.6	0.5	0.1					4
5	0.9	0.6	0.2					5
6	1.3	0.7	0.3					6
7	1.8	0.8	0.4					7
8	2.3	1.0	0.5					8
9	3.0	1.3	0.6					9
10	3.7	1.6	0.7					10
11	4.4	1.9	0.8					11
12	5.1	2.2	0.9					12
13	6.1	2.6	1.0					13
14	7.2	3.1	1.1					14
15	8.3	3.6	1.2					15
16	9.4	4.1	1.4	0.4				16
17	10.7	4.6	1.6	0.5				17
18	12.0	5.2	1.8	0.6				18
19	13.4	5.8	2.0	0.7				19
20	15.0	6.5	2.2	0.8				20
22		7.9	2.8	1.0				22
24		9.5	3.4	1.2				24
26		11.2	4.0	1.4				26
28		13.0	4.6	1.6				28
30		15.0	5.3	1.8	0.7			30
32			6.0	2.1	0.8			32
34			6.9	2.4	0.9			34
36			7.8	2.7	1.0			36
38			8.7	3.0	1.2			38
40			9.6	3.3	1.3			40
42			10.6	3.6	1.4			42
44			11.7	3.9	1.5			44
46			12.8	4.2	1.6			46
48			13.9	4.5	1.7			48
50			15.0	4.9	1.9	0.7		50
52				5.3	2.1			52
54				5.7	2.2			54

75% Rule for meter flow

5/8” ---- 15 GPM

¾” ---- 22 GPM

1” ---- 37 GPM




Full Adjustability


Hunter
CHECK VALVE
PRO-SPRAY PRS40

Maintenance

Conclusions

- Standard done right trumps Smart done poorly
- Choose what your client will use and maintain
- Use a soil probe to assess irrigation depths
- Plan maintenance and management
- Be a success story

“Problems are solved by people, not technology.”

Paul Glover

Thank you