

Drip Irrigation also Micro Irrigation or Trickle Irrigation

- History
- Advantages
- Disadvantages
- Components
- Strategy/Design
- Outside Walk-about

History

- 2000 years ago, Chinese used buried unglazed pots
- 1866, Afghanistan tested drip systems using clay pipe
- 1920s, Germany used perforated pipe systems

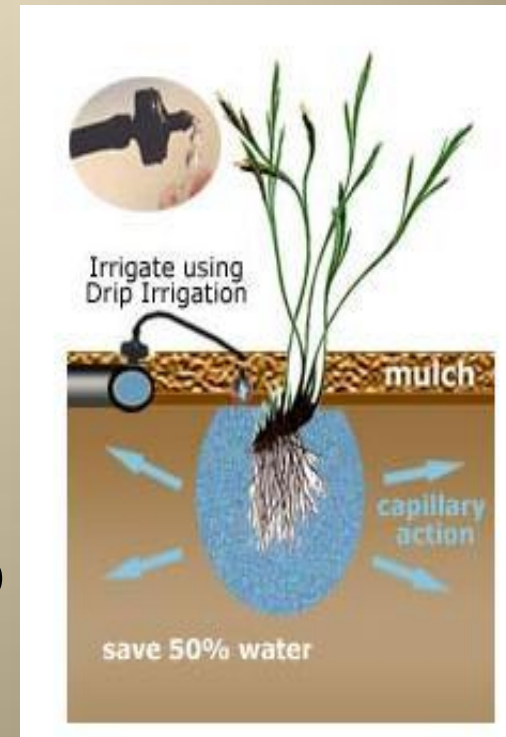


History

- 1959, Israel, use of a plastic emitter instead of tiny holes -- development of suitable plastics
 - Israel -- Inspiration in thriving tree near dripping faucet
 - Revolutionized agriculture
- Now widely used in farms, green houses and residential gardens
 - 1986, Hawaii, sugar cane, 37,000 acres in one plantation at a cost of \$30 million

Advantages of Landscape Drip Irrigation Compared to Sprinklers

- Deliver water only where needed
 - Don't waste water between plants
- Minimizes fungal problems that are spread through water contacting foliage
 - Example—Hydrangea Leaf Spots
- Less water lost to evaporation—30% to 50%
- Less water lost to run-off & reduced contamination of rivers and ponds
- Save money!



Advantages Continued

- Reduced weeds
- Increase crop yields
- Growing plants in arid climates
- Good for hills
- Save time and labor (no need to reposition sprinklers or haul hoses)
- Automate with a timer and vacations are covered

Disadvantages of Landscape Drip Irrigation

- Costs more than a flip/flop. \$3 to \$4 per plant
- Somewhat higher maintenance (emitter clogging, etc)
- Requires more pressure regulation & filtration than sprinklers (maybe)
- No foliage washing as with sprinklers
- Susceptible to rodent damage
- Farmers may need to plan for recycling/reuse of plastic
- And every now and then, plants seem to like a broader application of water

Components--tips

- Decide on a source (Lowes, Home Depot, SH&G, on-line store) and plan to stay with it.
- Components from one vendor are often not compatible with another
- ½ inch tubing from Lowes is NOT the same as ½ tubing from Home Depot

Start with a Backflow Preventer



- Preventing irrigation water from backing into household water supply is critical!
- Bib may include backflow preventer
- Irrigation meters in Wetumpka DO include a backflow preventer
- **IF IN DOUBT, DO USE ON HOUSE FAUCETS**

Highly Desirable: Battery Operated Timer

Can set current time, time to water, how many days per week to water, how many times to day to water, how many minutes to water



Hint: bring these inside in the winter

Consider use of Filter



- I have never used
- Optional with city water, but probably would prevent some clogging



Consider use of a Pressure Reducer



- Often not needed on zones with lots of plants
- Can adjust pressure at faucet or valve
- Blowouts tell you to either adjust manually or install pressure reducer
- Be sure to check for blowouts first few days after installation!
- Can adjust pressure at faucet or valve
- Can use more than one

Lay out your ½ inch backbone tubing. 250 feet max.



- Don't have to be straight lines
- Can wiggle to bring it closer to more plants
- Loops provide more consistent pressure for long runs
- Let soften in the sun before unrolling
- Can use a few rocks or bricks to hold in place temporarily

Hose ends



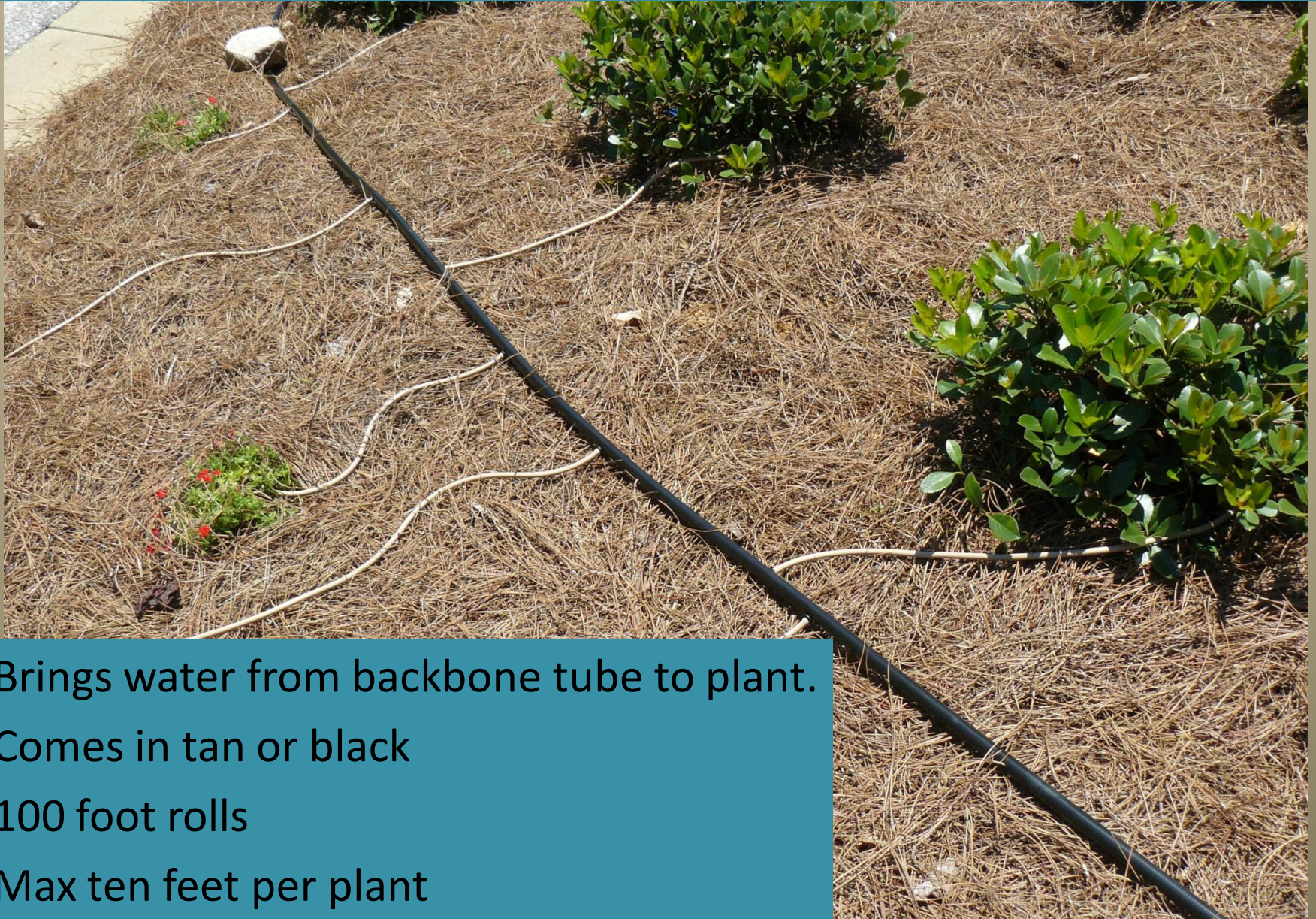
Tip: duck tape or wire to hold hose folded back works just fine



½ Inch Connectors: “T” and “in-line”



Add ¼ inch tubing



- Brings water from backbone tube to plant.
- Comes in tan or black
- 100 foot rolls
- Max ten feet per plant

Connector for ¼ inch tubing



Inserting connector into ½ inch tubing



▪Tip – inserting ¼ inch connectors is hard on the fingers and a small pair of pliers is a VERY useful tool.

▪Tip – if hose gets too soft in sun, it's harder to insert connector. Solution, turn on the water. Downside is water spraying in your face



On the other end of the ¼ inch tubing—
some type of emitter



Personal favorite: 1-10 gallon per hour adjustable emitter



- Allows plants with different needs to be in the same zone.
- Includes a stake so emitter stays in place
- “Lefty loosey, righty tighty”
- Hint: use multiple emitters with larger plants

Micro-sprayer.



- For bed with many small plants
- Great for annual bed
- Coverage from 5' to 10'
- Different patterns" 45, 90, 180, 270 and 360 degree sprayers.
- Subject to clogging, but a package of sprayers are cheap.
- Space for 100% overlap head to head
 - Space emitter with a 5' radius, 5' from other emitters.

Subsurface drip irrigation



Design

- Determine capacity of your water source.
 - Time how long it takes to fill up a bucket of known capacity
 - For example, 75 seconds to fill a five gallon bucket means that your capacity is 5 gallons x 3600 seconds/hour divided by 75 seconds
 - $5 \times 3600 / 75 = 240$ gallons per hour.
 - Will lose some capacity for uphill runs, long runs, filters, etc.
 - Soooo Max 240 1 gal/hour emitters or 24 10 gal/hour emitters

Design continued

- Group plants in “hydrozones”. Can vary amount of water to each plant, but not the frequency.
- List plants for this zone
- Determine volume of water to each plant
- Select the type and number of emitters for each plant

Design continued

Consider soil

Wetted Area Appearing on Soil Surface

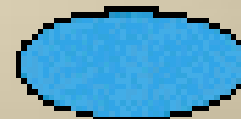
Sandy



Loam

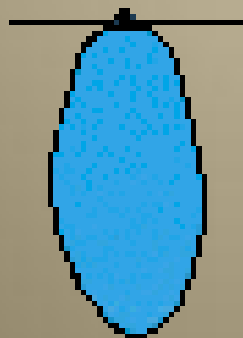


Clay



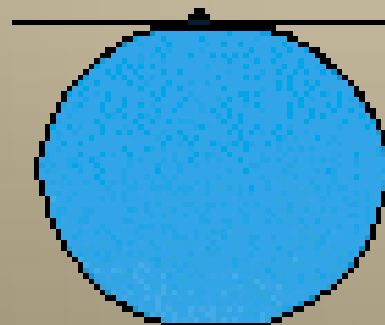
Cross Section of Wetted Area in Soil

Sandy



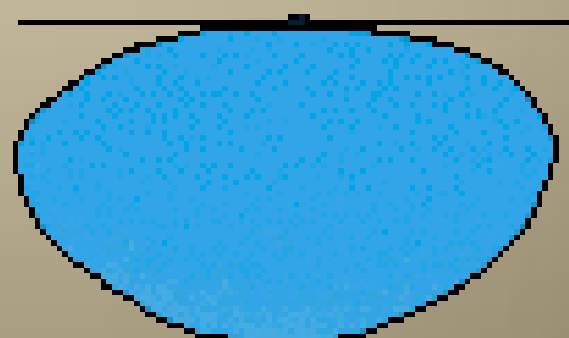
2' to 3'

Loam



3' to 5'

Clay



5' to 7'

Water required per plant

Plant	Cool Climate	Warm Climate	Hot Climate
Small Shrub	.3 Gallons per day	.5 Gallons per day	.8 Gallons per day
Large Shrub	.7 Gallons per day	1.4 Gallons per day	2.1 Gallons per day
Small Tree	2.7 Gallons per day	5.4 Gallons per day	8.1 Gallons per day
Large Tree	10.9 Gallons per day	21.7 Gallons per day	32.6 Gallons per day

Example

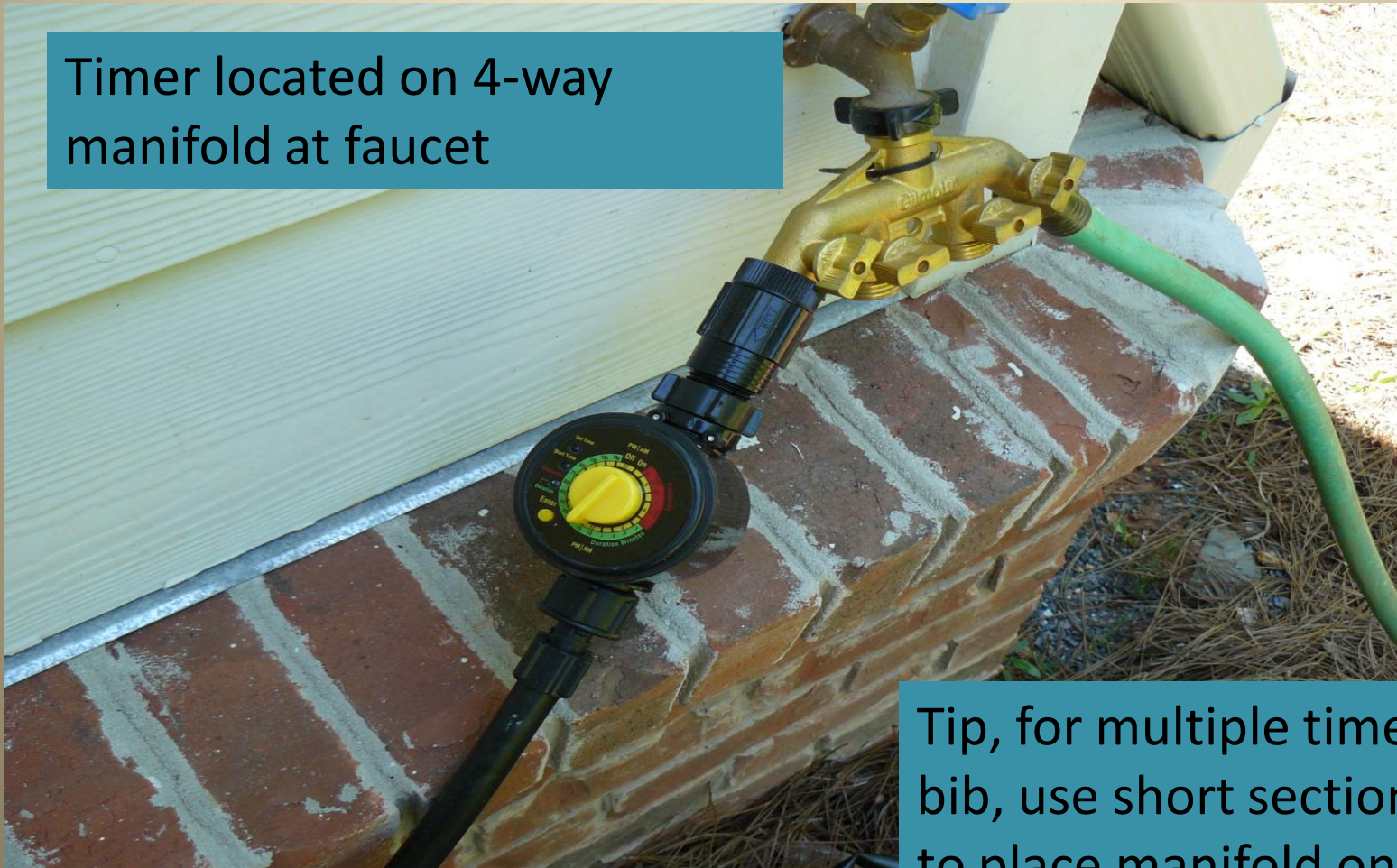
- New Bed with 10 Encore Azaleas
 - Hot Alabama summer, will need .8 Gallons per day or 5.6 Gallons per week. If you decide to water twice a week, that would be 2.8 Gallons each time
 - Options for emitters:
 - Assume two emitters per shrub, 1 Gallon per hour: set timer for 90 minutes
 - Assume two emitters per shrub, 2 Gallon per hour: set timer for 45 minutes

Best tool for tweaking drip system is observation

- Increase water duration/frequency if plants are drooping
- Consider drought tolerance, how well established plants are, characteristics of soil, etc.
- Consider plants that are “canaries in the coal mine”
- For example, I don’t start irrigating in the spring until my hydrangeas start to droop.

Going operational: Connect to water source

Timer located on 4-way manifold at faucet



Tip, for multiple timers at one bib, use short section of hose to place manifold on the ground and protect with box.

Tip - Squirrels like timers



Water Source cont

- Faucet on house
 - Splitter allows multiple lines from one faucet
- Splitter at end of hose allows water from house to multiple lines in a remote part of your yard
 - The hose running from the faucet is under pressure all summer
- Irrigation meter provides a completely separate water source from house (save over 50% in Wetumpka)

Control/Timing

- Manual
- Battery operated Timer
- Low voltage valves with electrical timer

Turn on water

- Look and listen for loose connections –you’ll see the mini-fountain or hear the “hiss”
- Look for plants you forgot to include
- Last, mulch everything.

Extending water source via 1 inch PVC



Add valves and control wire



Protect components with irrigation box



12 Station Timer—replaces 12 battery operated timers!



Questions, then
go Outside!