

Water in the Garden

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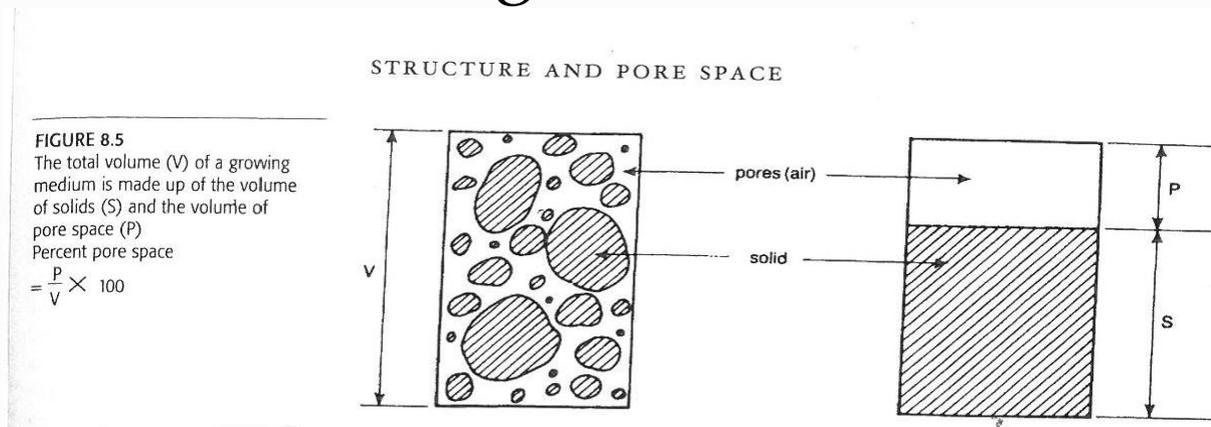
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The Science: Soil/Media & Water Relations

- Water is held in pores (spaces) between soil/media particles.
- Water and air occupy the same pore spaces.
- Moisture is critical for a healthy soil/media.
- All organisms including soil microbes need water and air to grow and thrive.



The Science: Water Availability

- Gravitational Water – Water in large soil pore spaces which drains freely.
 - Not available for plant growth
- Capillary Water – Water held in medium pore spaces.
 - Most available for plant growth
- Hygroscopic Water – Water held between the smallest soil particles.
 - Not available for plant growth



Field Capacity and Permanent Wilting Point

- These two terms refer to the soil moisture status.
- Field Capacity is the water in the soil immediately after free drainage of the gravitational water in the soil/media.
- Permanent wilting point is when the capillary water is used up and only hygroscopic water is left in the soil.
- Available water is the level of water in the soil/media between field capacity and permanent wilting point.



Wise Irrigation's Goal

- The goal is to maintain the available soil water between the permanent wilting point and field capacity.
- Applying too much water at one time wastes water to gravity and leaches nutrients from the soil.
- Applying water too frequently limits root access to oxygen by keeping pores spaces saturated.
- Check your soil before you water to see if it needs it.



How do you know if your soil needs water?

- Two common ways to know when to water ;
 - Feel the soil (best), or
 - Look at the plants
- Dig into the soil about three to four inches and try to work it into a ball.
 - If the ball barely holds together or falls apart the soil/media needs water.
 - If the soil ball holds together and doesn't break apart, you don't need to water.
- If the plant is beginning to wilt, time to water.



Ways to Conserve Water

- Water early in the day and apply water directly to the soil. Both reduce loss to evaporation.
- Increase the soil/media's organic matter. This increases the soil/media's water holding ability.
- Apply mulch to the soil/media surface.
 - Cools the soil and reduces water loss to evaporation.
 - Reduces weeds and their competition for water.
 - Apply 2-4 inches deep.
- Plant windbreaks, these reduce water loss due to transpiration from constant winds.



Methods of Watering/Irrigation

- Hand, sprinkling can or with hose (with or without nozzle).
 - Both are time and labor intensive.
 - Allow for more time to inspect plants.
- Sprinklers
 - High evaporation rates, Potential for spreading disease, May water nonplant area.
- Soaker or Spray hose or Drip Irrigation
 - All apply water directly to soil root zone, water/labor efficient and may be automated



Some Pictures



Soaker Hose or Spray Hose

- Soaker hose is a porous hose that can be connected to a garden hose and laid out along the base of the plants under the mulch.
- It allows water to slowly seep out along its length, spray hose are similar but have small holes that water sprays out of.
 - Ideal for plants that are planted close together.
 - Often made of recycled tires
 - Are cheaper and easier to install than drip irrigation.
 - Not recommended where plants are far apart since you don't want to water the area between plants.



Drip Irrigation Components

- Control Valve
- Filter
- Distribution Line
- Drip Line

