**Watering 101: Water- Friendly Gardening**

**1.** Soils Recap: Sand, Silt, and Clay

a. Sand soils: low water-holding capacities, low water available to plant, good oxygen flow, fast water infiltration, fast warming, high drainage rate, poor storing of plant nutrients, low organic matter content

i. Will require more frequent irrigation

b. Silt soils: medium to high water-holding capacities, high water available to plant, medium oxygen flow, medium water infiltration, moderate warming, medium to slow drainage rate, medium to high storing of plant nutrients, medium organic matter content

i. Holds a lot of water, does not need to be watered as often

c. Clay soils: high water-holding capacities, medium water available to plant, poor oxygen flow, low water infiltration, low warming, slow to very slow drainage rate, high storing of plant nutrients, high organic matter content.

i. Water drains slower, allow for longer intervals between watering but needs just as much water.

**2.** Watering- Basics

a. Plants rely on availability of water in the soil to maintain processes for growth and development

b. Water enters plant through its roots

c. Plants need water for photosynthesis, combines with carbon dioxide to produce simple sugars and is needed to form plant rigidity form and structure

i. Root Zone

a. Root zone: the soil surrounding the plant’s roots serve as a reservoir from which plant draws moisture and nutrients

b. Root zone is the area where watering should occur

c. Feeling the root zone helps determine if the plants needs water

ii. Consumption rates

1. Varies greatly among plant species, influenced by soil type, temperature, light intensity, rainfall, humidity, and wind speed

● Rule of thumb: it is better to water deeply and less frequently (rather than short and often watering), watering deeply encourages deeper root growth.

● Key to success: water enough to supply enough water to the root zone.

● Vegetable plants need about 1” to 2” of water per week, and may use 3-5x more water during the hot summer months

iii. Timing

a. Water before mid-morning to avoid evaporation and allows foliage to dry by sunset (prevents disease development)

b. Do not water overnight, can contribute to disease development

c. Plants will require the most amount of watering in midsummer, least in mid-winter, and intermediate during spring and fall

**3.** Irrigation-Demonstration: Drip system, automatic sprinklers, smart timers

a. Applying water to land or soil to assist with growing plants

i. Surface irrigation: includes both furrow and flood irrigation. Least efficient use of water, but requires less labor

a. Furrow irrigation: most practical for fruit/vegetable planting, use raised beds

i. Pro’s: reduces incidence of plant diseases because the foliage is not becoming wet, best for raised bed gardens

ii. Sprinkler irrigation: uses overhead watering of crops, applies water to both foliage and soil. Distribute water over a large area in a short period of time

i. Pro’s: can cover large spaces, maintenance costs are low, easily installed and maintained

ii. Con’s: water wasting, higher water costs, can encourage weed growth, high chances of run-off

iii. Drip irrigation: provide water to plants in a targeted location, slow but frequently applied through irrigation tubes (emitters) under low pressure

i. Pro’s: reduces water waste, minimizes evaporation losses, fewer diseases preventing foliage from becoming wet, weed growth is reduced

ii. Con’s: Cost of equipment and installation, breakdown of materials, easily disrupted, can be chewed

iii. Basin irrigation: using donut-shaped basins around each plant to allow for irrigation (best for trees and shrubs)

**4.** Practices for Effective Irrigation

a. Place plants with similar water needs together

b. Over watering occurs more often than under watering

i. Ex: Clay soils have a large water holding capacities and are likely to be overwatered

c. Water plants deeply, it’s about quality watering not quantity. Water enough that the soil is wet beyond depth of root and allow soil to dry partially (50%) before irrigating again

d. Avoid runoff and overwatering

e. Provide regular maintenance

f. Apply water uniformly (esp. for lawns)

g. Adjust for weather and season change

h. Apply mulch to maintain moisture, suppress weed growth and improve soil

structure

i. Amend soils of high sand and/or clay particles with organic matter to improve water holding capacities. Also reduces evaporation and maintains soil moisture

j. Avoid compacting the soil after watering

**5.** Vegetables, fruits and trees: need a lot water

a. Leafy vegetables need 6”-12” of root watering

b. Shrubs, trees, and non-leafy vegetable crops need 1-6 feet of root watering

**6.** Water Testing

a. Shovel/trowel/soil probe/stiff wire: digging and/or pushing into the soil will serve as a good indicator of how deep the water has penetrated into the soil.

b. Sprinkler can test: to measure sprinkler water output place 6 tuna/cat food containers on lawn, run your watering systems for 20 minutes. Measure how much water you have in containers. To get an average, add the amounts and divide by the number of containers. Multiply your average by 3 and you will know how much water is delivered in an hour.

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