***10-Minute University*™**
The Clackamas County Master Gardener Association in collaboration with and in support of the OSU Extension Master Gardener™ Program

Vegetable Gardening Using Less Water

Overview
OSU Extension Small Farms division has been testing the feasibility of "dry farming" organic vegetables commercially. Dry farming relies on residual soil moisture from the rainy season to grow crops and works best in areas receiving 20-inches or more annual rainfall. Success requires careful **management of soil moisture through site selection, soil preparation, and protection of soil surface.** Not all vegetables are suitable candidates for this approach so **variety selection** is important. This handout draws lessons from this research for the home gardener to grow vegetables while conserving water and soil.

Prepare the Site
Increase water holding capacity of the soil by adding organic matter (5-7% is ideal). Grow a fall cover crop like red and white clover, Phacelia, buckwheat. Cut down and turn into the soil in spring. Adding compost, commercial or homemade, is another option. If your garden soil is rich with clay, put it to use. Clay soil holds more water and nutrients than other types of soil. Amend clay with organic matter to make it more workable. For spring planting, the best time to prepare your site is the fall.

Minimize the Loss of Soil Moisture
Cover the soil surface with a layer of organic mulch to keep it from drying out. Organic mulch helps keep the soil cool so should be applied only after plants begin to grow. Examples include commercially composted yard debris, your own compost, grass clippings (if they are free from herbicides or pesticides), wheat straw or chopped up leaves. Cardboard, burlap bags and newspaper are also options.
Inorganic mulches like red and black plastic may be used to warm soil, prevent evaporation and weed growth. Mulches provide habitat for slugs; apply non-toxic slug bait.
Keep soil weed-free to reduce competition for nutrients and water.
Keep the top 2-inches of soil around plants loose by hoeing to make "dust mulch". Keeping the soil loose helps fill in any cracks in the soil thus reducing evaporation.
Do not walk on surfaces where plants grow, reducing compaction, preserving soil's water holding capacity.

Adopt Techniques to Make Efficient Use of Irrigation Water
Use drip irrigation to minimize evaporation and deliver water where needed.
Group plants according to their water needs into zones.
Use irrigation timers to regulate frequency and volume of water; zoned control improves efficiency.
To reduce evaporation, water early in the morning before soil and air warm up.

Time Your Planting
Rely on soil moisture and temperature to determine when to begin planting preparation. To test for moisture, squeeze a ball of soil in your hand. If it stays in a ball yet crumbles easily, it is ready. Use a

soil thermometer to determine when to plant seeds. Consult a planting calendar or seed package for specific temperature requirements.
Often suitable varieties are not commercially available or are not available at the correct time to plant. Start seeds indoors so plants will get a start ahead of the heat.
Plant varieties that mature early, before onset of summer heat. Some may also be planted in late summer for fall harvest. Examples are lettuce, cabbage, Swiss chard, and broccoli.
Use cloches, "walls-o-water", and cold frames to help warm-season plants like tomatoes, peppers, and melons get an early start.
Try planting winter crops such as purple sprouting broccoli, cabbage, radicchio etc.

Apply Special Planting Techniques
Pre-soak large seeds overnight prior to planting; this helps speed germination.
Prior to planting small seeds, press soil surface firmly and gently with a board. This is thought to increase soil capillary action which brings up moisture to the surface where seeds and plant roots can access it. For the same reason, press the soil around plants as they are transplanted.
Plant in blocks rather than rows. Plant close together to shade soil. Place smaller plants in the shade of tall ones.
If you wish to grow without use of regular irrigation, plant further apart -- twice the normal distance to reduce competition for water and nutrients.

Choose Drought-Tolerant Vegetable Varieties
Heirloom vegetable varieties may be more drought tolerant if they were developed before there was running water for irrigation. Try varieties dry farmers recommend (visit OSU Dry Farm Program websites listed below). Plant more vining crops like squash, beans (dry shell types), peas, melons; they often require less water. Finally, consider using **locally grown seeds**. While they are not specifically grown for drought conditions, they are more likely to be adapted to local climate.

Resources
Dry Farming in the Maritime NW, Intro to Dry Farming Organic Vegetable, OSU Extension Publication EM9229, https://catalog.extension.oregonstate.edu/
Website http://smallfarms.oregonstate.edu/dry-farming-resources
Water-Wise Vegetables by Steve Solomon
Growing Vegetables West of the Cascades by Steve Solomon
Gardening without Irrigation: or without much, anyway by Steve Solomon
The Resilient Gardener: Food Production and Self-Reliance in Uncertain Times by Carol Deppe
Regional Seed Sources: Adaptive Seeds, Territorial Seeds, Abundant Life Seeds, New Dimension Seeds, Nichols Garden Nursery, Peace Seeds, Siskiyou Seeds

Master Gardener™ Advice
- Call Home Horticulture Helpline: 503-655-8631 (Clackamas County), 503-821-1150 (Washington County), 503-445-4608 (Multnomah County).
- Visit www.cmastergardeners.org for 10-Minute University™ videos and handouts.