Food Gardening with Less Water

When facing serious drought, we can be water-wise and successful growing a food garden. Here are some things to consider when planning a food garden during a drought and some suggestions for optimizing water usage.

In a normal year, Sonoma County has over 30 inches of rainfall. Some of this is stored in the soil for plants to use in the spring as the weather warms up and growth begins. Gardeners use this ñbankò of available water to dry farmð a technique that depends on sufficient soil moisture and deep-rooted plants that scavenge to access water without adding much supplemental irrigation. Dry farming depends on the fact that water is stored in the soil when the growing season begins. In concurrent years of low rainfall or during severe drought, dry farming will not be an option.

If dry farming is not an option, the first step in deciding to have a food garden is to determine if extra water beyond basic household needs of cooking, bathing, etc. is available. This includes rain collection systems as well as captured tap or well water (not to be confused with ñgraywaterò). Captured water is uncontaminated water that does not enter the drain such as a bowl of water used to rinse fruits and vegetables or buckets used to capture water while the shower warms up. Note that collected roof water may have contaminants and should not be used for overhead watering of food crops. Guidelines exist for its use in underground drip systems.[i]

Graywater is untreated waste water that has not been contaminated by toilet discharge. This can include waste water from your washing machine and bathtubs. Graywater is an option for irrigating your ornamentals. But it should not be used on edible crops except fruit trees. This is due to the potential that human pathogens might be present. After installing a graywater system, do not use household products that add salt, boron or chlorine bleach to the soil.[ii]

FOOD GARDEN ACTION PLAN

1. Compost, compost, compost! Add organic matter to the soil. If soil is sandy, the addition of organic matter allows the soil to hold more water. Organic matter also helps open up soil allowing roots to go deeper and find more water at lower depths if there is any. Compost increases soil nutrition which helps plants produce better yields with the same amount of water. Adding more nitrogen to the soil will only produce more leafy green growth which will increase the plantsô need for more water.

2. Mulch, mulch, mulch! Mulch keeps soil cool, conserves moisture and reduces weeds. Use three to four inches on top of the soil. The larger the material size, the deeper layer you need to provide. Choose from straw, fallen leaves, hulls, shredded bark, grass clippings and newspaper. It is not advisable to use plastic sheeting as mulch because it deprives the soil of much-needed oxygen. Keep mulch two inches away from the base of the plant to avoid the possibility of rot. When hand watering, pull back mulch so that water goes directly into the soil.

3. Use a drip system. Use a drip system[iii] for the most efficient application of limited water. Group plants that have the same moisture need together on the same valve. Irrigate only as long as it takes to moisten the active root zone. For most crops, the active root zone is 6 to 12 inches. Water, preferably, in the morning or in the cool hours of the evening so that soil stays evenly moist. Donôt forget the drip system once it is set up. Monitor and adjust it, as needed.

4. Be selective. Learn about individual plant moisture needs. Consider the water available to support crops through harvest, and grow only the amount and types of vegetables the family will consume. For example, plant two beds of vegetables instead of six; plant four tomatoes instead of ten. To get the most out of the water you apply, grow high yielding vegetables like beans, chard, mustard, eggplants, peppers, tomatoes, squash, quinoa and amaranth.

Avoid crops that need consistent moisture unless a particular variety has been bred to need less water. Most brassicas (broccoli, cabbage, Brussels sprouts, kohlrabi, cauliflower and radishes), lettuce and other greens, beets, carrots and other root crops, celeriac, celery, leeks and onions perform best with regular water. Generally, cool season crops are not drought resistant and growing them during the heat of the summer requires lots of extra water to keep them cool.

Consider the following observations[iv] on which crops need the most water and when:

- Some beans and sweet corn need considerable water to produce a good crop. Beans need water most when they are blooming and setting fruit.
- Corn needs water most during tasseling, silking and ear development. Yield is directly related to quantities of water, nitrogen and spacing.
- Peas need water most during pod filling.
- Other vegetables, such as cucumbers and squash, and fruits, such as melons, need water most during flowering and fruiting.
- Tomatoes, peppers and eggplant need water most during flowering and fruiting. (Note that after tomatoes set, they can do very well with reduced water).

After deciding what to grow, choose varieties that tolerate dry conditions.[v] Look for the terms ñdrought-resistantò or ñdrought-tolerantò in seed catalogs or on plant labels (note that ñheat-tolerantò refers to above ground air temperature and is not the same as drought-resistant or drought-tolerant). Even these varieties require water. Some water is needed to start seeds or establish a seedling, and to periodically irrigate the plant through the growing season. Selecting varieties that are described as ñwidely-adaptedò in addition to drought-resistant and drought-tolerant also may be helpful.

5. Consider days to maturity. A crop needing fewer days to mature requires fewer irrigations before harvest (e.g., 62-day óStupiceô vs. 85-day óCherokee Purpleô tomato). Look for early-maturing or short-season varieties. Days to maturity will vary from one part of the country to another as well as from one microclimate to another.

6. Plant intensively. In deep soil or well-amended soil (compost!), roots have more room to grow deeper and find water if it is present. This will allow you to plant more intensively which also may have the benefit reducing transpiration and evaporation. Use the spacing recommended in the ñYear-Round Gardening in Sonoma Countyò[vi] document as a guide. You may find that planting in mounds versus rows or slightly reducing the recommended spacing allows you to have a productive garden using less water.

7. Eliminate weeds. Weeds compete for water. Be aggressive in removing them from growing areas.

8. Use light-weight row covers. Cover plants as a means to collect dew. Dew drops onto soil and keeps it moist. While using row covers can help prevent insect damage, look under the cover from time to time to monitor plant growth and check for unwanted insects trapped inside.

9. Use shade. Heat-sensitive vegetables can benefit from being planted where they receive some afternoon shade. Plant them underneath or behind taller plants or consider using shade cloth.

10. Use windbreaks. The moisture on leaf surfaces is dried by moving air, causing the plant to need more water. In coastal and other windy areas, windbreaks will help roots keep up with leaf demands.

11. Determine when it is time to water again. Squeeze the soil in your hand: if it sticks together, it is still moist; if it is crumbly and falls apart, it is time to water.

See the Food Gardening with Less Water page on the UC Master Gardener of Sonoma County website to view the video ñGrowing a Thriving Vegetable Garden with Less Waterò and to access a number of helpful documents.

[i] ñRain Barrels Part IV, Testing and Applying Harvested Water to Irrigate a Vegetable Garden,ò Rutgers University and the New Jersey Cooperative Education.
[ii] ñGraywater,ò Sonoma County Water Agency.
[iii] ñDrip Irrigation in the Food Garden,ò UC Master Gardener Program of Sonoma County.
[iv] ñHome Vegetable Garden Management During a Drought in Colorado,ò Colorado State University Extension.
[v] ñDrought-Resistance Crops and Varieties,ò Electra de Peyster, Food Gardening Specialist, UC Master Gardener Program of Sonoma.
[vi] òYear Round Food Gardening in Sonoma County,ò UC Master Gardener Program of Sonoma County