

Why Conserve?

Sonoma County has a Mediterranean climate. Almost all of our rain falls from November through April and usually there is no rain at all during the summer months. Our water supply is limited to groundwater and to surface water flows from the Russian River/Lake Sonoma system, both of which have been decreasing in recent years. Water conservation is crucial.

The main rule of summer watering is to try to **use and waste as little water as possible while still keeping your food garden productive**. The most useful techniques for water-wise gardening are good soil preparation, drip irrigation and mulching.

Soil Preparation

Soil that is loosened deeply with generous amounts of organic material (eg. compost) mixed into it stores much more water than compacted soil. Plant roots will grow deeper and be protected from the summer sun, and the garden will need less water. An added bonus is that soil in good condition holds nutrients better and drains well in the winter, making water-logging and root rotting less of a problem.

Containers used for growing food plants must be large enough for healthy root systems so plants can be productive. In large containers such as a planter box or half wine-barrel, a mixture of about 1/3 amended topsoil and 2/3 good quality organic potting soil will give the best results. In smaller containers use just the potting soil and refresh at least a quarter of the soil mix each year.

Drip Irrigation

Drip irrigation uses water efficiently. Unlike sprinklers and hoses, drip irrigation brings water directly to plant roots without losing it to evaporation or runoff. Drip provides precise water control, increases yields, results in fewer weeds, saves time and labor, keeps leaves and fruit dry reducing disease problems, promotes better soil structure, conserves energy, and can use low water pressure.

Components of a **standard drip system** include a length of ½-inch tubing that brings water from a pipe or garden hose and feeds the tubes going to



the plants. Usually a filter and pressure regulator are installed at the garden faucet to which the drip system is attached.

Options for delivering water to the plants include the following:

- Porous **soaker hose** which oozes along the entire length – these attach to garden hoses and are inexpensive. Use only with city water.
- **Tubing with in-line emitters** – this comes in ½-inch width with emitters every 12 inches and ¼-inch width with emitter spacing of 6 or 12 inches. These work very well in food gardens and last a long time.
- **Micro sprinklers** – good for watering seeds beds, and for watering under fruit trees and cane berries, these come in a wide variety of spray patterns and flow rates.
- **T-tape** – used for larger vegetable gardens, these inexpensive plastic lines are laid out along rows and drip from in-line emitters. Ground must be fairly level to work well and rows must be straight.

Water quality and pressure must be considered when laying out a drip system. Local irrigation supply houses are happy to assist with system design and starter kits are available at hardware stores. Another great resource for information on drip irrigation is [*Drip Irrigation for Every Landscape and All Climates*](#) by Robert Kourik, a long-time Sonoma County gardening expert.

Any irrigation system should have the lines checked and flushed yearly, or more often if water quality is poor. The lines will last much longer if they are protected from the sun by mulches, (see below).

When to Water for How Long?

The most active feeding roots of most plants are in the top 1 to 2 feet of soil, so this area is the most important to keep moist. Although they ultimately save water, drip systems need to be run more frequently to keep soil moisture levels ideal. Roots need air and will die in water-logged soils, so over watering is bad for plants as well as a waste of water. However, if only the soil surface is kept moist, roots will stay very shallow, dry out quickly and the plant cannot reach full potential.

The amount of water applied should equal the amount of water lost. How fast water is lost depends on several factors, including:

- **Soil type:** Sandy and silty soils dry out more quickly and water moves through much faster than clay soils. This means drip lines and/or emitters must be spaced more closely and can be turned on more frequently for short times. Clay soils hold water much longer and water will spread horizontally much farther, though it can take a long time to do so. Drip lines in clay soils should have low output and be turned on longer.
- **Containers:** These tend to dry out much faster than the ground and may need watering every day during hot weather.
- **Plant needs** change with age: Young plants have small root systems so the soil surface must be kept more moist than for mature plants. In addition, some plants such as lettuce, broccoli, radishes and onions are shallow rooted, whereas tomatoes, squash, and melons can grow deep roots and draw moisture from a large area.
- **Mulch:** A protective layer of material on the soil surface will shade the soil and reduce evaporation. Mulched areas will need watering less frequently. (See below for more information.)
- **Weather:** Heat and wind are very dehydrating so irrigation may need to be

increased during these times. Your garden loses moisture both from the soil and the plant's leaves, so large plants can pull a lot of water out of the ground on a hot day. Remember to reduce watering during cooler periods and when days shorten in the fall. It is often better to decrease watering time than frequency.

Mulches

Mulch is material that is used to cover the ground around plants in order to discourage weeds and to keep the soil from drying out. It is most useful in the summer since it cuts down substantially on water use. Some mulches can make it difficult for water from sprinklers or a hand-held hose to percolate down into the soil – but mulching works perfectly with drip irrigation when mulch material is added over the tubing.

Mulch is also valuable in the winter to help protect roots from frost and soil from erosion and compaction, but it can prevent soil from warming in the spring. Mulch can also be home to slugs, snails, and earwigs, so it should not be applied until plants are well established.

- **Vegetable Beds:** Organic mulches, such as straw, alfalfa hay or old leaves, and/or aged manure with bedding or rough compost, are preferred for vegetable beds as they will slowly decompose and enrich the soil.
- **Paths and Trees:** Wood chips and sawdust should not be used in vegetable beds but are fine for paths and for covering a layer of compost around fruit trees and other perennials. Always leave an unmulched ring of space right around the base of perennial plants, trees, and shrubs.
- **"Sheet mulching"** involves layering materials over a lawn, moist bare soil or mowed annual weeds, starting with compost or manure, then cardboard or newspapers, and topping with tree trimming chips or straw. This technique provides added weed suppression, can be used around trees or in paths and is an excellent way to improve the soil in a new area where you want to plant edibles in the future. See the iGrow document, "How to convert your lawn to a garden".