

GardenNotes #714

Irrigating the Vegetable Garden

Outline: Conserving water in the vegetable garden, page 1
 Furrow irrigation, page 1
 Sprinkler irrigation, page 2
 Drip irrigation, page 2
 Soaker hose, page 3
 Additional information, page 5

Conserving Water in the Vegetable Garden

In vegetable production, an adequate supply of water during the growing season is directly related to produce quality and yields. Many vegetables become strong-flavored with water stress.

Several gardening techniques (including soil preparation, mulching, and efficient irrigation) help conserve water in the vegetable garden. For additional information on soil preparation and mulching, refer to Colorado Master Gardener GardenNotes available on-line at www.cmg.colostate.edu.

Check soil moisture regularly. Irrigate when the top 2-4 inches of soil is dry to the touch. This is especially important if using mulch, where water can be held in the soil for longer periods of time.

Houseplant watering meters are helpful in evaluating the soil moisture content under mulch. Realize however, that these inexpensive meters are somewhat inaccurate. If the fertility level is high, the meter will read on the wet side. If the fertility is low, the meter will read on the dry side.

Morning irrigation, when temperatures are cool but rising, is preferred for the garden.

Furrow Irrigation

For gardeners who have irrigation water from a ditch, furrow irrigation in the traditional row-style garden layout may be most practical. As a rule of thumb, adjust water flow for the furrow so that the water reaches the end of the row 1/3 of the time into the irrigation period. For example, if the irrigation period is 15 minutes, the water should reach the end of the row in five minutes. Soil erosion is a major disadvantage of furrow irrigation.

Sprinkler Irrigation

Sprinkler irrigation is considered more efficient in water delivery than furrow irrigation. It is easy to measure the amount of water applied and easy to manage. Since it wets the entire soil surface, weed seed germination will be high.

Sprinkler irrigation is discouraged on vegetable crops prone to foliar diseases, like tomatoes, peppers, and potatoes subject to Early Blight. The splashing water spreads disease organisms and water on the leaves creates favorable conditions for disease development. Tall crops, such as corn and pole beans may interfere with water delivery patterns.

As a rule of thumb, vegetables use around ¼ inch of water per day during typical summer weather. If the garden is watered every four days, apply one inch of water per irrigation. The gardener can quickly learn how long to run the sprinklers by measuring the amount of water in several straight-sided cans placed around the garden.

Delivery rates depend on the type of sprinkler heads used and the spacing of heads in the garden. For example, pop-up type heads deliver around 1½ inches per hour and would typically run 40 minutes to apply 1” of water, which would last around four plus days. Rotor type heads deliver around ¾ inch per hour and would typically run for 80 minutes to apply 1” of water, which would last around four plus days.

Windy weather will increase water demand. Beans and corn will be significantly higher in water demand during blooming or tasseling/silking. Mulched gardens will be lower in irrigation need.

Since the water needs of the vegetable garden are different from grass, it should be on a different irrigation zone than the lawn. Water use will be low in the spring when crops are small and temperature are cool and will increase as the temperatures rise and crops come into bloom.

Sprinkler irrigation is easy to set-up on an irrigation controller. It may be on a multi-zone controller like the lawn. With an automated system, install rain shut-off controls or manually adjust the controller for rain events.

Garden stores also carry a variety of single zone controllers that connect on the tap before the hose. Some types are manually turned on and automatically turn off the water flow after a set number of minutes or gallons. More expensive models will automatically turn the water on and off at intervals set by the gardener.

Drip Irrigation

Drip irrigation is well suited for the block-style garden layout and raised beds. Several different drip systems are available with microsprays, bubblers, and soaker hoses.

A disadvantage of a drip system is that they require relatively clean water. Systems readily plug with dirt, algae or salts in the water. This may not be a factor with well-treated and filtered, municipal water supplies.

Soaker Hose

The soaker hose or “leaky pipe” type of drip system allows water to seep out the entire length of the pipe. It is easy to use in a traditional row style or raised-bed garden. Several brands are available in local markets. [Figure 1]



Figure 1. Soaker hose seeps water out along the length of the hose.

Ideally, the soaker hose is placed on the soil surface under the mulch. Alternatively, it should be buried a couple of inches into the soil to protect the hose from breakdown by sunlight.

On a raised-bed box with a single row of tomatoes, make a single hose run down the middle. Be careful not to punch the hose with the wire tomato cages. [Figure 2]



Figure 2. 30” wide tomato box with soaker hose running down the middle. Hose will be covered with mulch. A single row of tomatoes will be planted down the middle, trellised at 24” spacing.

Run the hose down the bed and double back on a four-foot wide bed with a single row of vine crops, a double row of corn, or a triple row of cole crops or potatoes. [Figure 3]



Figure 3. On a corn, vine crops, and potatoes, run the soaker hose down and back the four-foot wide bed.

In a four-foot wide bed with smaller vegetables, like lettuce, spinach, and carrots, run the hose at 12-inch spacings, making four runs down the box. [Figure 4]



Figure 4. On small vegetable, run the soaker hose at 12-inch spacing (four runs down a four-foot wide bed).

The soaker hose can be cut to desired lengths and fitted with hose end fittings. On the bottom end, simply fold over the hose twice and hold closed with a piece of wire.

For uniform water delivery, keep runs short, generally less than 25 feet but never longer than 50 feet. The ground must be reasonably level. On slopes, run several short lengths.

Keep the pressure low by only turning on the valve part way. The water should drip out of the hose, not spray. High pressure may rupture the hose.

Determine the run time by examining the soil moisture content. Run time will vary with the brand of hose, water pressure, and spacing. Soaker hoses typically run for only 10 to 15 minutes to thoroughly water the soil. Some brands have a small disc that inserts into the hose fitting to reduce pressure. Due to the very low water flow, these brands may need to run for an hour or more to adequately water the garden.

Drip systems can be easily automated with a multi-zone controller like the lawn or a single zone controller that connects at the tap before the hose. Some single-zone controllers are manually turned-on and automatically turn-off after a set number of minutes or gallons. More expensive models will automatically turn the water on and off at intervals set by the gardener. With any automated system, install rain shut-off controls or manually adjust the system for rain events.

On raised-bed gardening, it is easy to run a water line with a tap to each box. [Figure 5]

Figure 5. Tap at edge of box.

The soaker hose is more tolerant than other types of drip for small amounts of dirt, algae, or salts in the water.



Additional Information – *CMG GardenNotes* on vegetable gardening:

- | | | | |
|------|---|------|---|
| #711 | Vegetable Garden: Soil Management and Fertilization | #718 | Early Blight of Tomatoes |
| #712 | Sample Vegetable Garden Seed Catalogs | #719 | Vegetable Garden Hints |
| #713 | Block Style Layout in Raised Bed Vegetable Gardens | #720 | Vegetable Planting Guide |
| #714 | Irrigating the Vegetable Garden | #721 | Sample Planting for Raised-Bed Garden |
| #715 | Mulches for the Vegetable Garden | #722 | Frost Protection and Extending the Growing Season |
| #716 | Water Conservation in the Vegetable Garden | #723 | Growing Vegetables in a Hobby Greenhouse |
| #717 | Growing Tomatoes | #724 | Vegetable Gardening in Containers |

Authors: David Whiting, Carol O’Meara and Carl Wilson: Colorado State University Cooperative Extension

- Colorado Master Gardener *GardenNotes* are available on-line at www.cmg.colostate.edu.
- Colorado Master Gardener training is made possible, in part, by a grant from the *Colorado Garden Show, Inc.*
- Colorado State University, U.S. Department of Agriculture and Colorado counties cooperating.
- Extension programs are available to all without discrimination.
- No endorsement of products mentioned is intended nor is criticism implied of products not mentioned.
- Copyright 2003-2006. Colorado State University Extension. All Rights Reserved. *CMG GardenNotes* may be reproduced, without change or additions, for non-profit educational use.



Revised December 2006