

# The Watering Can



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## Watering for Growing Great Vegetables!

The general water rule learned in the Basic Master Gardening training course tells us established plants require one inch of water per week? This is a good rule but it doesn't quite work with vegetable gardening. For example, most vegetables have shallow roots, which rarely exceed 24 inches in depth and require supplemental watering in addition to what is provided by 'Mother Nature.'

### *Crop Requirements and Responses*

Vegetable crops require from around 6 inches of water in a season for radishes to 24 inches for tomatoes and watermelons. Precise irrigation requirements can be predicted if you know how much water the particular plants needs (wouldn't you like to see that information posted on a seed pack? i.e. 24 inches of water required from germination through harvest, 110 days), how dry the soil layer is, and current precipitation values (National Weather Service Precipitation - [http://www.srh.noaa.gov/rfcshare/precip\\_analysis\\_new.php](http://www.srh.noaa.gov/rfcshare/precip_analysis_new.php)).

Lack of water influences crop growth in many ways. The effect depends on the severity, duration, and time of stress in relation to the stage of growth. Two sensitive periods are common to nearly all vegetable crops—during harvest and 2 to 3 weeks before harvest. Although all vegetables benefit from irrigation, each class responds differently.

*Leaf vegetables.* Cabbage, lettuce, and spinach are shallow rooted and benefit from frequent irrigations throughout the season. As leaf expansion relates closely to water availability, these crops, especially cabbage and lettuce, are particularly sensitive to water stress during the period of head formation through harvest. Overwatering can result in burst heads.

Broccoli and cauliflower, although not grown specifically for their leaves, respond to irrigation much as the leaf vegetables do. Cauliflower, in particular, is noted for being sensitive to water stress at all stages of growth, responding to drought with reduced growth and premature heading.

*Root, tuber, and bulb vegetables.* In carrots, beets, radishes, potatoes, and onions yield depends on the production and translocation of carbohydrates from the leaf to the root or bulb. The most sensitive stage of growth generally occurs as these storage organs enlarge. Carrots require an even and abundant supply of water throughout the season. Stress causes small, woody, and poorly flavored roots. Uneven irrigation can lead to misshapen or split roots in carrots and early bulbing in onions.

*Fruit and seed vegetables.* Cucumbers, melons, pumpkins and squashes, lima beans, snap beans and peas, and peppers and tomatoes are most sensitive to water stress at flowering and as fruits and seeds develop. Fruit set on these crops can be seriously reduced if water becomes limiting. Regular supplies of water during the period of fruit enlargement can reduce the incidence of fruit cracking and blossom-end rot in tomatoes. Irrigation is often reduced as fruit and seed crops mature.

### *Ten Water Rules*

A number of irrigation practices and strategies are recommended for vegetable crops to make every drop of water count.

1. **Reduce area planted.** When irrigation water is in short supply, it may be necessary to grow less rather than water too little. If you have a choice, plant the most productive land rather than marginal land.

2. **Select less sensitive crops and cultivars.** During periods of anticipated drought, factors such as water requirements assume increased importance. Certain crops and cultivars are less sensitive to short periods of water stress than others. Select short season cultivars which generally require less water.

3. **Begin season with adequate soil moisture.** Preplant irrigation benefits many vegetable crops. Such irrigation builds subsurface soil moisture and promotes a deeper root system. Avoid over-irrigation, which wastes water and can leach chemicals into groundwater supplies. Current National Weather Service soil moisture conditions can be found at - <http://www.nws.noaa.gov/oh/hic/current/soils.shtml>.

4. **Establish proper plant stand.** Rapid emergence and a uniform plant stand make the most efficient use of soil moisture. Wet soil exposed to sunlight has greater evaporation loss than soil shaded by a crop. Thinning out the plant population in vegetable crops saves little water but may encourage healthy growth.

5. **Consider transplants.** Proper germination and emergence in the garden requires careful water management. Less water and more precise control can often be obtained by using transplants. Once transplanted, vegetables generally develop shallower root systems than direct seeded vegetables and may require more frequent irrigation.

6. **Consider drip irrigation, mulches, and row covers.** Drip or micro-irrigation is an efficient system of irrigating vegetables. Combine use of such systems with mulches and row covers for added efficiency which can save water by reducing evaporation.

7. **Improve irrigation scheduling.** Good irrigation scheduling is essential for all irrigation systems - apply the correct amount of water at the correct time. Irrigation scheduling requires careful attention to monitoring soil moisture, climate, and crop growth.

8. **Maintain proper soil structure and fertility.** Proper soil structure permits optimum infiltration and water holding. Proper soil fertility encourages the best plant growth and utilization of available soil moisture.

9. **Achieve good weed control.** Weeds compete with crops for soil moisture and decreases yields. Weeds can use more water than the crop. Good weed control reduces competition for soil moisture and increases water use efficiency.

10. **Maintain good plant health.** Insect and disease damage restrict the growth and water use efficiency of vegetable crops, reducing both yields and quality. Vegetables are more sensitive to water stress than are most other crops. Even short periods of drought can adversely affect both yield and quality.

### **To Summarize**

Use the 'One Inch Rule' but keep in mind there are exceptions to every rule. Prepare an annual outdoor water budget with most of the 'water' reserved for your vegetables. Plan ahead so the vegetable garden will have the supplemental water resources needed to produce a robust, healthy crop without going over your 'budget.' Fill the flower beds with drought resistant perennials which require little to no watering, and do your part to keep our watershed healthy and abundant.

<sup>1</sup> Portions of this article were developed from *Washington State University Extension Drought Advisory Bulletin EM48303, April 2005.*