



Summer Care of the Home Vegetable Garden

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One of the most important factors for successfully growing vegetables in Oklahoma is the care given the garden during the summer. The gardener naturally wants to give his or her garden the best care possible. In order to accomplish this, the gardener must have a basic knowledge of how to properly irrigate, control weeds, use mulches, and control diseases and insects.

Watering

Most full-season vegetables need about 20 inches of water during the growing season for good growth. The water in the soil may come from rainfall or from irrigation.

The following guidelines will help determine the amount and method of irrigation necessary for your garden.

Amount and Frequency of Water

A plant can only use the moisture in contact with its seed or roots. After the seed germinates, roots are produced that continuously invade greater volumes of soil from which water may be extracted. Therefore, only the soil around the seed needs to be kept moist following planting. Toward the end of the season, and when growing vegetables from transplants, it is best to keep the soil moist to a depth of about one foot or more.

After seeds have been planted, they may be misted with a hand-held hose until seedlings emerge.

During May and June, garden plants will use about one inch of water each week. In July, August, and September, they require about two inches of water per week for best growth. It normally takes this amount of watering per week to maintain production if no rain falls. An inch of water is 62 gallons per each 100 square feet of garden area.

One way of determining when to irrigate is to take a soil core sample from the plant root zone and squeeze it into a ball. If the ball holds together in the palm of your hand, the soil has sufficient water. If it crumbles, water can be applied.

At the crumble-stage, the average soil will hold an inch of water per foot. If this water is to be applied with a sprinkler, its delivery should be determined by placing three or four cans under the sprinkler pattern to see how long it takes to accumulate an inch of water.

Water consumption for a garden will gradually increase up to two inches of water per week during hot weather, and then taper off as the weather cools.

Remember that it is much better to water the garden well once a week rather than to sprinkle it daily. Light, frequent

waterings are not recommended. The garden may be watered by using sprinklers, letting water run between rows (furrow irrigation), or by using trickle irrigation or porous irrigation hoses.

Methods of Irrigation

Sprinkler irrigation is most common among home gardeners. A sprinkler should apply water uniformly and at a rate slow enough to prevent runoff. A sprinkler should not produce a mist that is subject to drifting. It is preferable to use a sprinkler that will water the garden at one setting so it won't be necessary to walk into a wet garden to move the sprinkler.

When using a sprinkler it is best to irrigate early in the morning so that plant foliage can dry off quickly and thus reduce the chance of diseases.

Furrow irrigating with a garden hose is generally not efficient unless the rows are quite short. While this type of irrigating does reduce evaporation losses, it poses several disadvantages. It causes erosion, and the hose needs to be moved each time a row has been irrigated. In addition, percolation often is heavy at the upper end of the garden moving water below the root system, which is then lost to the crop.

Furrow irrigation is much less efficient when used to germinate seed and when used on gravelly or sandy soil. To germinate seed, it is necessary to keep the water in the furrows until it has soaked over to the seed—which may take as long as a day—while on gravelly soil, too much water is lost through percolation.

Trickle irrigation involves the use of flexible capillary tubing to convey water to the individual plants. This system reduces evaporation and percolation to a minimum when properly installed and operated. See Extension Facts BAE-1511.

A porous irrigation hose (soaker) usually consists of a canvas hose, 20 feet or more in length, which attaches to the garden hose at one end and is sealed at the other. It minimizes evaporation and applies uniform coverage, but it must be moved frequently to prevent percolation losses.

Weed Control

Weeds rob vegetables of valuable water, light, and nutrients. Weeds often harbor insects, diseases, and nematodes that can damage vegetables and greatly reduce yields.

Mulching, hoeing, and handweeding are methods that can be used to control most of the weeds in the garden and to eliminate the problems of applying a herbicide and the possibility of herbicide injury to the garden crop. Good soil preparation, adequate control of weeds before planting, and planting crops when the soil is warm enough to get them up rapidly are all good practices that will help maintain a minimum amount of labor for weed control. Many Oklahoma gardeners in rural areas have ample space for gardening. If this is the case, be sure to leave enough space between rows to allow room for cultivating equipment.

Cultivation and hoeing should be done when weeds are small because weeds compete with the crops for light, water, and nutrients. Also, when weeds are large, they are much more difficult to remove without damaging the crops. Cultivation and hoeing should be done shallowly so that injury to the root system of the crop plants will not occur. Handweeding in the crop row is usually necessary.

Weeds may also be controlled with herbicides. However, chemical weed control in the home garden is difficult because of the diversity of the crops grown in the garden. It is hard to find an herbicide that is selective enough to remove a specific weed without the potential or probability that it will also kill or damage some of the crops in the garden. With several types of plants located close together in a small area, some may be seriously damaged by any herbicide that you might select. However, there are a few formulations available now which make them safer and easier to use. For example, glyphosate foam is easier to use and poses less risk to desirable plants. Some preemergence herbicides can also be used successfully in the garden when transplants are used or after seeds sown have emerged and matured. Visit your local garden center or county extension office for information on current preemergence herbicide products.

The best weed control in the home garden is a sharp hoe and good mulch.

Mulches

Mulch is a layer of any type of material, organic or inorganic, spread on the surface of the soil around and under plants. The application of mulches has many advantages, such as improving plant growth, enhancing the appearance of the garden, and reducing time spent in maintenance.

The most common reason for using a mulch is to help control weeds. Where the mulch is thick enough, usually four to six inches, very few weeds will grow.

Mulches also help conserve moisture during periods of drought by reducing the amount of soil moisture lost through evaporation. At the same time, mulches maintain uniform levels of soil moisture, which is important in preventing blossom-end rot of peppers and tomatoes. Wide fluctuations in soil moisture may induce this physiological disorder. Mulches also aid in maintaining a uniform soil temperature. They act as an insulation, keeping the soil cooler during the warm months of the year.

Organic mulch materials increase water-holding capacity of sandy soil and increase aeration of heavy clay soils as they gradually become mixed with the soil. Organic mulches also furnish food for microorganisms found in the soil. During decomposition of the organic material, soil microorganisms secrete a sticky material that promotes granulation of the soil.

Mulch aids in preventing surface soil erosion, particularly if it has been established for a few weeks. In addition, it helps keep leaves, flowers, and fruits free from soil which is important with strawberries and tomatoes.

Mulches should be applied after the soil is warm enough for active root growth. Straw, grass clippings, sawdust, leaves, newspapers, and black plastic sheeting all make excellent mulches for the home vegetable garden. If black plastic is used, it is best to cover the plastic with lighter colored organic mulch to reduce the temperature around the plants.

Disease Control

Plant diseases adversely affect yield and plant quality of vegetables. Various pathogenic microbes interacting with environmental conditions that are suitable for disease development cause diseases of plants. The disease-causing microbes are spread from plant to plant by air currents, water, insect vectors, and by contaminated seeds, transplants, infested soil, and implements.

Diseases of vegetables can be prevented by a combination of good management practices to achieve good control.

Seed Treatment

The use of a protective fungicide will help protect seeds against seed rot and damping off in the early stages of seed germination. Use according to directions on the label. Chemically treated seed should not be handled with bare hands.

Plant Treatment

Various fungicides are available for foliage treatments. Fungicide materials should be sprayed on all exposed parts of the plant. Fungicide treatments for foliage diseases are usually used on the following vegetables: pepper, eggplant, potato, tomato, watermelon, cucumber, muskmelon, squash, and beans. Read and follow all label directions and precautions, especially the time interval between application and harvest of the crop. Before starting any kind of treatment, it is essential to obtain a positive diagnosis from a qualified specialist.

Resistant Varieties

Certain vegetable varieties are resistant to one or more diseases, and the home gardener should take advantage of this built-in protection. Remember, healthy seed and disease-free transplants are essential—do not use plants that show abnormalities.

Crop Rotation

Rotating where vegetables are planted is an excellent way of keeping harmful soil organisms to a minimum. Experienced gardeners know the value of proper crop rotation. They are aware that the same crop planted in the same spot year after year decreases in productivity. This is because soil borne diseases, soil insects, nematodes, and toxic chemical residues tend to collect and build up in a given area. As these detrimental factors increase, crop yields decrease. Therefore, it is necessary to rotate the location of vegetables each season.

Each family of vegetables has certain unique effects on the soil, and most vegetable varieties within a given family are susceptible to the same diseases and insects. Therefore, it is important to know which vegetables are included in each

family. The common backyard vegetables generally fall into nine distinct families. The pea or legume family includes peas and beans of all kinds. The mustard family is one of the largest, which includes cabbage, collards, brussel sprouts, kale, cauliflower, broccoli, turnips, and radishes. Beets and spinach belong in the goosefoot family. Carrots, parsley, and celery are in the parsley family. The nightshade family includes potatoes, tomatoes, eggplant, and all varieties of pepper. The vinecrops are in the gourd family—squash, pumpkin, watermelon, cantaloupe, and cucumber. The composite family is made up of lettuce, dandelion, and artichoke. Onions, garlic, and chives make up the lily family. Sweet corn comes from the grass family.

Remember that just rotating the placement of each single vegetable is not enough. Rotation of family groups is also important.

Very small gardens and the lack of other available space in the landscape often make rotation impossible. However, soil solarization has proven to be very effective for small garden areas. Soil solarization controls a wide variety of soil pests and is a technique commonly used in integrated pest management programs. For more information on soil solarization, see fact sheet EPP-7640.

Sanitation

Sanitation will help reduce the hazard of disease-causing microbes being carried over from the previous crop. Plant refuse may be plowed under in the fall or removed from the garden and thoroughly composted before it is returned to the garden. Plant parts known to be diseased should be removed from the garden and not composted, since pathogenic microbes may survive composting.

Plowing under plant residues in the fall or soon after clearing the garden space hastens the decay of organic matter. Removal of diseased plants, plant residue, and weeds in and around the area will help in preventing the occurrence of some diseases.

The objective should be to reduce populations of harmful microbes that normally live in the soil and to prevent the reintroduction of such pathogens by practicing crop rotation and sanitation.

Environment

A healthy, vigorous plant is less susceptible to attacks from most pests and diseases than one growing poorly. Plant the garden in full sun and make sure that plants have adequate moisture, nutrients, and spacing for maximum growth and production.

Insect Control

Insects are always a threat to home vegetable gardens. The gardener must check plants frequently to detect the presence of injurious insects and be ready to control them as soon as damage is evident. When checked frequently, many garden insects can be controlled successfully without the use of insecticides. Do not forget that cultural (crop rotation, sanitation, and solarization) and mechanical (hand-picking, traps and attractants, water pressure sprays, and insect vacuums) controls are effective methods for controlling pests as well.

Some insects feed on the fruit and leaves; some bore into the plants, while others suck sap from the plants. No

single chemical will protect plants from all of these pests. Many insecticides are available today. Insecticides should be selected with care and chosen with a specific pest in mind. Common insecticides for home garden use are available in synthetic, botanical, biological, and mineral-based formulations. Biological controls are a good option, particularly for caterpillar pests. Other materials homeowners may use for insect control include diatomaceous earth, oils, and soaps.

A mixture of compatible insecticides can be used on most vegetables and will give excellent protection against many garden insect pests (check labels for compatibility suggestions).

Insects that live in the soil and damage roots and underground portions of the stems cannot be effectively controlled by treating the above ground portions of plants.

White grubs and wireworms may cause serious damage to garden plants. Grasses and a variety of weeds serve as alternate hosts; thus, clean cultivation and good bed preparation is helpful to prevent damage by soil pests. If the garden area has a history of white grubs or wireworm problems or if garden plants are to be planted in an area that was grassy or weedy the previous season, then an insecticide should be broadcast and lightly tilled into the soil prior to planting. However, routine treatment for soil insects is generally not warranted; rather, it should be based on a history of the garden area. Control of soil insects on a “rescue” basis after planting is usually not successful.

Cutworms include several insect species whose larvae chew plant stems at the soil surface shortly after transplanting, cutting them at ground level. In general, cutworm problems are sporadic but can occasionally be severe. Plants begin to wilt and usually die soon.

After transplanting, check daily for wilted plants with completely or partially severed stems. Perhaps the most effective method of controlling cutworms is to use “collars” around each new transplant to protect young plants from attack. Collars should be removed after about two to four weeks from transplanting, so that they do not interfere with normal plant growth. Also, remove weeds in and around the garden to help eliminate sources of additional cutworms. If an insecticide is used, effectiveness is increased by banding the insecticide at the base of the plant, preferably at dusk or shortly before. Watch for plants that wilt and do not respond to additional water. First, check for damage to the stem at the soil line (cutworms), if no damage to the stem is visible, inspect the soil near the roots for grubs and wireworms. For more detailed information on control of insects in the home garden, see fact sheet EPP-7313, Home Garden Insect Control.

Remember insecticides are poisonous, so READ AND FOLLOW THE DIRECTIONS ON THE LABEL for their use, storage, and disposal.

Do not apply any pesticide closer to the time of harvest than indicated on the label.

For additional information, consult these fact sheets, which are available at your local county Extension office:

- HLA-6004, Oklahoma Garden Planning Guide
- HLA-6005, Mulching Garden Soils
- HLA-6009, Fall Gardening
- HLA-6012, Growing Tomatoes in the Home Garden

- HLA-6014, Making a Compost Pile
- HLA-6032, Vegetable Varieties for Oklahoma
- HLA-6033, Raised Bed Gardening
- EPP-7307, Beneficial Insects
- EPP-7313, Home Garden Insect Control
- EPP-7640, Solar Heating (Solarization) of Soil in Garden Plots for Control of Soilborne Plant Diseases

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