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Growing Peppers in the Home Garden

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Peppers (*Capsicum spp.*) are warm-season vegetables grown as annuals in Ohio. They are in the Solanaceae family (also known as the nightshade family) along with the tomatoes, eggplants and potatoes. Peppers are easily grown and can be prolific producers. With the variety of colors, shapes and flavors available from sweet to spicy, peppers are excellent additions to any home vegetable garden.

Pepper Site Requirements

Peppers need at least six to eight hours of full sun during the growing season. Ideally, soil should be well drained and contain high organic matter. However, peppers can thrive in moderately fertile soil. The addition of compost, peat moss or other organic material can slowly help improve soil texture, fertility and drainage. Alternatively, gardeners may plant peppers in containers or raised beds to improve soil conditions and drainage.

Suggested Cultivars

Cultivar and variety selection may be determined by transplant or seed availability. However, peppers come in a variety of colors, shapes and flavors worth trying. Read plant and seed tags for information on mature size, color and shape, hardiness zones, disease resistance, and days to maturity to find what works for you. Talk with your local garden center about ordering special varieties that might be of interest to you.

For those who like it hot...

Why are some peppers hot and some sweet? The difference is the quantity of capsaicinoid compounds of the pepper variety/cultivar. The Scoville scale, an index of pepper spiciness based on capsaicin content, lists peppers in order of heat level.

The peppers in the *Capsicum annuum* species may rate differently on the Scoville scale. However, some of our hottest peppers such as 'Habanero', 'Trinidad Moruga Scorpion', 'Scotch Bonnets', 'Carolina Reaper', and 'Ghost' pepper or 'Bhut jolokia' are members of the species *Capsicum chinense*. 'Tabasco' pepper is *Capsicum frutescens*. Remember that hot peppers contain capsaicin, a volatile oil that may present a danger or painful burning to children or pets that may enter the garden.

Figure 1. 'Habanero' peppers, as those shown above, measure between 100,000 and 350,000 on the Scoville scale, an index of pepper spiciness. *Photo by Dave Horvath.*

Figure 2. Ghost peppers like this 'Chocolate Ghost Pepper' measure around 1,000,000 plus on the Scoville scale. *Photo by Dave Horvath.*

Planting

Plant peppers in the spring after risk of frost has passed. Frost and late night chills can damage or kill flowers on peppers and result in stunted or deformed fruit or reduced yield. Temperatures should be between 70 and 80 degrees Fahrenheit in the day, and above 55 degrees Fahrenheit at night (60 to 70 degrees Fahrenheit is ideal).

Warm temperatures suitable for pepper production are usually late in the spring in Ohio. Gardeners who anticipate this will have greater success and earlier harvest by using pepper transplants over direct seeding. Choose transplants with a strong root system with six to nine leaves on the plant showing no sign of damage or disease. Check under leaves for signs of insects or mildew before buying. Transplants already displaying flowers and fruit at the garden center are less desirable, as this can be caused by stress. If transplants do have early fruit or flowers, remove them before planting to help the plant develop stronger roots and foliage for a fuller, more productive plant in the garden.

Direct seeding in the garden is not recommended in Ohio unless protective coverings such as hoop houses are used. Starting seeds indoors is an option for Ohio gardeners and can be done eight to ten weeks before expected planting date.

Starting pepper seeds indoors

Pepper seeds germinate when soil temperatures are 70 to 80 degrees Fahrenheit, so a warm location or external heat source such as a seedling heat mat may be needed to start seeds indoors. Place seeds into individual starter pots, plug trays or flats with seed-starting mix or potting soil. When the first leaves appear, move plants to a sunny spot or under a horticultural grow light. Thinning pepper seedlings down to one pepper seedling per well will reduce competition for nutrients and maintain healthy airflow around the plant. When seedlings are approximately six to eight weeks old, begin “hardening off” to adapt them to outdoor climates. Place the plants outdoors in the sun for a few hours each day, increasing hours gradually over a week or two. Bring plants indoors before sunset to avoid nighttime temperatures.

Transplanting

When transplanting outdoors, plant seedlings no deeper than the soil line from the tray. Planting deeper on most plants will cause stem rot. Generally, plants should be spaced 18 to 24 inches apart in the garden but this may change, depending on the variety. Follow recommendations on seed packets or plant tags. Proper placement is important to allow room for growth and adequate airflow to reduce disease pressure. Suppressing weeds with newspaper or mulch is also recommended to reduce nutrient competition and harborage sites for insect pests. Weeds in the nightshade family may also carry diseases that could affect peppers.

Row covers can be used to protect young plants from early spring frosts and as a physical barrier against insects. However, covers must be removed in high heat (80 F or higher) to prevent heat damage and leaf scalding. Row covers must be removed during flowering to allow pollinator access for fruit to form.

Plant Care

Pepper plants may need irrigation during dry periods to prevent fruit loss. Even and consistent watering is important to prevent blossom end rot, a deformity of the fruit. Peppers should get 1 to 2 inches of water per week. Gardeners can determine the length of time needed for their irrigation system to deliver 1 inch of water by placing a 1-inch container, such as a tuna can, under the watering system and recording the time needed to fill the container. Watering early in the day will allow leaves to dry completely, reducing disease risk. Using a soaker hose or drip irrigation can help avoid unnecessary leaf wetness by applying water directly to the soil where it is needed. Avoid standing water. Peppers require a lot of water, so using mulch can help maintain soil moisture. However, do not mulch until soils have warmed up. Mulching too early can keep soils cold, which can damage transplant roots.

Fertilizing

Before the growing season, a soil test is recommended. This will help gardeners determine:

- Is fertilizer needed? A soil test evaluates the chemical composition or nutrient content of soil. This evaluation tells the gardener if the soil is deficient of

nutrients (i.e., nitrogen, phosphorus, potassium, etc.) and how to correct the issue if needed.

- What is your soil pH? Soil pH indicates the availability of plant nutrients in the soil solution (soil and water combined). Plants have a wide-ranging pH tolerance; however, every plant has an idea pH range for healthy growth. If the pH is in the extremes, it may limit nutrient availability to the plant.
- Does the soil pH need to be adjusted? Peppers do best when soils are a little acidic with a pH of 6 to 6.8. Lime will raise the pH (become more basic) and sulfur will lower pH (become more acidic).

Need more information? Refer to OSU Extension Fact Sheet, HYG-1132, "Soil Testing for Ohio Lawns, Landscapes, Fruit Crops and Vegetable Gardens," to learn about soil testing procedures.

Fertilizers are labeled on the bag by the percentage of weight of the three macronutrients: nitrogen (N), phosphorus (P) and potassium (K). These nutrients are always displayed as numbers such as 12-10-5 or 10-10-10. For example, a 10-pound bag of 10-10-10, will have 1 pound of nitrogen, phosphorus and potassium per bag. Fertilizers formulated for tomatoes and vegetables gardens are appropriate for peppers (12-10-5 or 10-10-10). However, if soil test results show high levels of phosphorus, gardeners should switch to a low or no-phosphorus fertilizer mix (such as 24-0-15 or 25-3-12) to prevent excess nutrient from entering water resources. Follow all label instructions for use. Do not over apply as over-fertilizing can burn and damage plants.

Common Pepper Problems

Peppers are in the same family as other solanaceous crops such as potatoes, tomatoes and eggplant, and are susceptible to similar pest problems. Therefore, crop rotation is encouraged. Any of the solanaceous crops should not be planted in the same space year after year to prevent the buildup of disease.

Regular scouting for insects and diseases in the garden can be time consuming, but is important for a successful garden. Scouting is the routine observation of possible problems in the garden. Insect pests should be scouted on a weekly basis to keep populations low before flower set. Aphids may be present on the underside of leaves near growing branches. To see if aphids may be on the plant, look for sticky honeydew on the lower leaves. Aphids can be wiped off with a cotton swab, garden glove or towel if present in small numbers. Aphids may be controlled with natural predators that feed on aphids such as lady beetles and lacebugs. These natural predators should be left in the garden if discovered. European corn borer larva may chew holes near the fruit stem causing internal rot of the fruit. Hand picking the European corn borer larva and dropping them into a bucket of soapy water can manage small populations. For heavy infestations, insecticides are available. Follow all label instructions when using pesticides in the garden.

Sanitation is also a very important practice often overlooked. Sanitation includes cleaning hands, gloves and tools that contacted diseased plant tissue. This can help avoid the spread of infection to other plants. For example, Tobacco Mosaic Virus can be transmitted by the hands of a smoker as the virus lives on tobacco. Gardeners who smoke should take care to thoroughly wash their hands and remove clothes that were smoked in to avoid infecting peppers.

Several pests are commonly found feeding on pepper plants. More information about controlling these pests is found by searching Ohioline on the Ohio State University Extension website.

Common pepper diseases

Disease pests common to pepper plants are bacterial leaf spot, anthracnose, fusarium and Verticillium wilt, Phythopthora blight, tobacco mosaic virus, cucumber mosaic virus, and tomato spotted wilt virus.

Common pepper insects

Insects commonly found on pepper plants are aphids, flea beetle, tarnished plant bug, stink bugs, spider mites, thrips, European corn borer, and pepper maggot.

Cultural problems

Poor weather conditions such as late frost or cold nights may cause flower drop by the peppers, or failure to set fruit. Hot dry winds, periods of extreme heat (above 90 F), or drought can cause abortion of small immature fruits and flowers. Blossom damage from high temperatures may cause malformed, though still edible, fruit.

Harvest

Most peppers are picked in the immature, green stage. Bell peppers are usually ready when 3 to 4 inches long, firm and green. The fruit will easily break from the plant when ready to harvest. Leaving peppers on the plant longer will allow further color such as red, orange or even purples when fully matured. This requires a longer growing season, so a second row of peppers, one for early harvest and one for a late colorful harvest, can help when more variety is desired.

Figure 3. ‘Purple Belle’ pepper can be harvested in its immature green stage, as seen here, or left to mature to its full purple color. *Photo by Dave Horvath.*

Original authors: J. D. Utzinger and W. M. Brooks, Ohio State University. (Originally published in 1984.) Marianne Riofrio, Ohio State University Extension. (Revised in 1992.)

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