

Home Gardening Series

Peppers

Dr. Craig R. Andersen
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Vegetables

Environment

Light – sunny
Soil – well-drained, loose
Fertility – medium-rich
pH – 6.0 to 7.0
Temperature – warm
Moisture – average

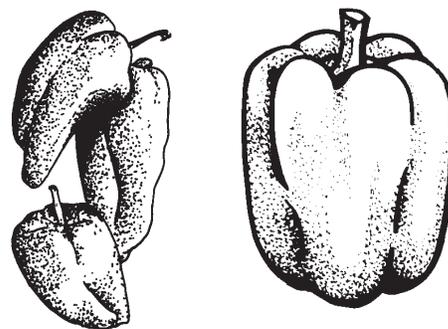
Culture

Planting – transplant after soil is warmed
Spacing – 18-24 x 36 inches
Hardiness – tender annual
Fertilizer – medium-heavy feeder

Peppers – *Capsicum annuum*, *Capsicum chinense*, *Capsicum frutescens*

The exact origin of peppers is debatable, but the possibilities have narrowed to Central and South America. The reason they are called peppers goes back to Christopher Columbus. He found the natives of the West Indies growing and using very hot forms of *Capsicum*. Columbus assumed they must be some form of pepper because of their extremely pungent flavor. The new spice, unlike most of the New World plant products, was an instant hit. Peppers were apparently adopted by other cultures immediately, and their use quickly spread worldwide. *Capsicums* were growing in Spanish monastery gardens by the end of the 15th century, and by the first half of the 16th they had spread to Italy, France and Germany.

It seems likely that peppers were domesticated simultaneously and independently in several different South and Central America locations. The plants seem to have been under cultivation by some time between 5200 and 3400 B.C. The *Capsicums* show great diversity in shape, color, taste and names. They are called aji, chile, chillis, pimentos, peperone or paprika. In writings from the early 1800s, bell peppers were often referred to as mangoes or mango peppers due to their association with pickled mangoes (the tropical fruit) being imported into the United States. In certain areas of the South, the name is still used.



Most of the commercial cultivars of *Capsicum annuum* include the sweet bell peppers, the red paprika and pimiento peppers, a variety of hot peppers, among them the familiar jalapeno and Nu-Mex. *Capsicum chinense* includes the extremely hot, bright yellow-orange habenero Scotch Bonnet and bird pepper. *Capsicum frutescens* are the tepin, tabasco, cayenne, Thai hot and ornamental peppers. There exist some 20 wild species of pepper in South America which generally have tiny, red and very hot fruits.

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Cultivars

Crop	Cultivar	Days to Maturity	Seed/ 100 Ft of Row	Disease Resistance or Tolerance	Sources	Remarks
Peppers						
Sweet peppers	Keystone Resistant Giant	75	66 plants	Mosaic	8, 10	Large, green, thick-walled fruit, heavy yield.
	Yolo Wonder L	75	66 plants	Mosaic	1, 2, 9, 10, 11	Large, green, thick-walled fruit, heavy yield.
	Bell Boy	70	66 plants	Mosaic	2, 4, 9, 10	Hybrid, large, green, thick-walled fruit, heavy yield.
	Sweet Banana	72	66 plants		1, 2, 4, 6, 8, 9, 10, 11	Long, pointed, yellow fruit.
Hot peppers	Hungarian Wax	65	66 plants		1, 2, 3, 5, 6, 8, 9, 10, 11	Long, pointed, waxy yellow fruit.
	Long Thin Cayenne	70	66 plants		1, 6, 7, 9, 11	Long, thin, green fruit that turns red when mature, very hot.
	Serrano Chili	73	66 plants		1, 2, 3, 4, 7, 8, 11	Small, elongated, dark green fruit that turns red when mature, extremely hot.
	Jalapeno	72	66 plants		1, 2, 3, 4, 5, 7, 8, 9, 10, 11	Dark green, thick-walled, remains green when ripe, very hot.
	Tam-Mild Jalapeno	68	66 plants		2, 4, 6, 10, 11	Medium green to red, mild with less pungency.

In 1772, the botanically minded Dominican priest, Francisco Ximenez, wrote of a Cuban pepper so inflammatory that a single pod could render "a bull unable to eat." These effects are due to a family of odorless but hot-tasting chemical compounds known as capsaicins.

Bell peppers are tender, warm-season vegetables which require somewhat higher temperatures than tomatoes. Several other kinds of garden peppers (bell, pimiento, tabasco, cayenne, chili and paprika) may be grown as food or ornamentals in Arkansas. Do not confuse these with black pepper, *Piper nigrum*, a shrub which yields the seed we use for a familiar table condiment. They are not related. The sweet varieties of peppers are by far the most popular.

Sources

There are many different sources for peppers. Some include the following:

1vh W. Atlee Burpee Company
300 Park Avenue
Warminster, PA 18974-0001
Tel: 1-800-888-1447

2v Chesmore Seed Company
5030 Highway 36 E.
St. Joseph, MO 64507
Tel: 1-800-383-0865

3vh The Cook's Garden
P. O. Box 5010
Hodges, SC 29653-5010
Tel: (800) 457-9703

4vh Gurney's Seed and Nursery Company
110 Capital Street
Yankton, SD 57079
Tel: (605) 665-1930

5v Johnny's Selected Seeds
Rural Route 1, Box 2580
Albion, ME 04910-9731
Tel: (207) 437-4301

6vh Park Seed Company
1 Parkton Avenue
Greenwood, SC 29647-0001
Tel: (800) 845-3369

- 7vh Shepherd's Garden Seeds
30 Irene Street
Torrington, CT 06790-6658
Tel: (860) 482-3638
- 8v Southern Exposure Seed Exchange
P. O. Box 170
Earlyville, VA 22936
Tel: (804) 973-4703
- 9vh Stokes Seeds, Inc.
P. O. Box 548
Buffalo, NY 14240-0548
Tel: (716) 695-6980
- 10v Twilley Seed Company, Inc.
121 Gary Road
Hodges, SC 29653
Tel: 1-800-622-7333
- 11v Willhite Seed Company
P. O. Box 23
Poolville, TX 76487
Tel: 1-800-828-1840

v – vegetables

h – primarily herbs

Cultural Practices

Bell peppers are tender, warm-season vegetables which require somewhat higher temperatures than tomatoes. Peppers have all the disease and insect problems of tomatoes and should be treated the same way.

Planting Time

Peppers are best started from transplants after the soil has warmed in the spring. The plants cannot tolerate frost, and they do not grow well in cold, wet soil. Pepper seed can be slow to germinate and need to be 76 degrees or warmer to germinate in 7 to 10 days. Some of the cultivars of *C. frutescens* may take 20 to 100 days to germinate and require much patience. When night temperatures are 50 degrees F or lower, the plants may be injured. The plants grow slowly, leaves may turn yellow and the flowers will drop off. Transplants should be planted in the field when they are small (4 to 5 inches high). Larger plants will tend to set fruit too early and result in smaller fruit throughout the season. Plant peppers a week to 10 days after tomatoes are transplanted.

Set transplants 18 to 24 inches apart in the row. A dozen plants, including one or two salad and hot types, will produce enough peppers for most families.

Care

Peppers thrive in well-drained, fertile soil that is well supplied with moisture. The soil should be limed to raise soil pH above 6.0. Apply 8 ounces of a starter fertilizer solution (1 tablespoon of soluble fertilizer per gallon) to each plant when transplanting. Hoe or cultivate shallowly to keep down weeds without damaging roots. Mulch is recommended, especially for gardeners who wish to maintain their plants for full-season harvest. Black plastic or organic materials are suitable for mulching.

Water the plants thoroughly every four to seven days during dry periods. Plants confined in containers need daily watering. Side-dress with nitrogen fertilizer (ammonia nitrate) at the rate of 1/2 pound per 100 feet of row (equivalent to 1/2 table-spoon per plant) after the first peppers have grown to the size of golf balls. Apply supplemental fertilizer (side-dressing) cautiously, only after a good crop of peppers is set, at two-week intervals. Do not get fertilizer on the leaves. Gardeners do more harm than good by applying too much fertilizer. Irrigate during dry periods; a uniform moisture supply is essential throughout the harvest season.

Many gardeners train their pepper plants to stakes or trellises with great success. Using one stake for every four plants, the gardener can support the plants with one string tied about 15 to 18 inches above the ground. This prevents the plant from tipping over with wind and rain. All varieties are not equally suitable for staking.

Insect and Disease Control

Peppers have the same problems as tomatoes do in the garden and should be treated as such.

Harvesting

Fruits may be harvested at any size. The bell varieties, however, are usually picked when they are full-grown and mature (3 to 4 inches long, firm and green). When the fruits are mature, they will break easily from the plant. Some gardeners prefer to cut off the fruits to prevent damage to the plant. The fruit may be left on the plant to ripen fully to a red, yellow or purple color. Hot peppers, except jalapeno, are usually harvested at the red ripe stage. Entire plants may be pulled in the fall before frost and hung in an outbuilding or basement to dry.

Common Problems

People who use tobacco should wash their hands with soap and water before handling pepper plants to prevent the spread of tobacco mosaic virus disease.

Grow resistant varieties, if possible. Watch for accumulations of aphids on the underside of the leaves. When a large aphid population is present, honey-dew appears on the lower leaves and fruit. If this situation occurs, apply a suggested insecticide.

diseases – tobacco mosaic virus, tomato spotted wilt virus, cucumber mosaic virus, bacterial spot, anthracnose, Alternaria leaf spot, Cercospora leaf spot, southern blight and Phytophthora root rot.

insects – aphids, flea beetles, cutworms, corn earworm.

cultural – blossom end rot (moisture irregularities or calcium deficiency), blossom drop (when night temperatures go above 75 degrees F, or when the number of fruit set is excessive).

Harvesting and Storage

days to maturity – 100 to 120 from seed, 70 to 85 from transplants

harvest – Green peppers will turn color in 7 to 10 days after maturity. Harvest sweet peppers when they reach full size, while still in the green or yellow state. When allowed to mature on the plant most varieties turn red, are sweeter and increase in vitamin A and C content. Cut instead of pulling to avoid breaking branches. Hot peppers are allowed to ripen and change color on the plant. Entire plants may be pulled and hung just before frost.

approximate yields (per 10 feet of row) – 2 to 8 pounds

amount to raise per person – 3 to 10 pounds

storage – medium cool conditions (45 to 50 degrees F), moist (95 percent relative humidity); 2 to 3 weeks

preservation – frozen, pickled, in relishes and as dried spices

Frequently Asked Questions

Q. Why do my pepper plants grow large but do not develop fruit? They are dark green and do not appear to be diseased.

A. Hot weather conditions can reduce fruit set of peppers. The most common problems in Arkansas are hot, dry winds and warm nights (above 75 degrees F). Too much nitrogen fertilizer often results in poor yields, although the plant will appear large and healthy.

Q. What causes small, dry, sunken black areas near the end of the peppers?

A. This is blossom-end rot, similar to that in tomatoes. It is caused by drought and calcium deficiency, by pruning roots through improper cultivation or by the need for lime to raise soil pH. Blossom-end rot is more severe in some varieties of peppers than in others. Irrigate and apply lime if needed.

Q. Why do my pepper plants often bloom but fail to set fruit?

A. Peppers, like tomatoes, are sensitive to temperature. Most peppers will drop their blooms when daytime temperatures get much above 90 degrees F and night temperatures above 75 degrees F. They will also drop their blooms in the early spring if temperatures remain cool for extended periods. Hot peppers, such as jalapenos, withstand hot weather fairly well and can often produce fruit through the summer. Optimum temperatures fall between 70 and 80 degrees F for bell-type peppers and between 70 and 85 degrees F for hot varieties.

Q. If I remove the first few blooms on a pepper plant, will my overall production be increased?

A. The plant will be stunted if it sets the first bloom that flowers. This is likely when the plant is growing under marginal conditions which include low fertility or moisture. By removing the first bloom, the plant will grow larger before setting fruit which often results in higher total yields.

Q. If you plant hot peppers beside sweet peppers, will the sweet pepper plant be producing hot fruit?

A. No. Pepper flowers are normally self-pollinated, although they can cross-pollinate. However, the result of this crossing will appear only if seed is saved from this year's crop and planted next year.

Q. Is there any difference in taste or nutritive value between green peppers and those that mature and turn red or yellow?

A. Peppers that are allowed to mature and ripen entirely, from green to yellow, are sweeter and higher in vitamin content, especially vitamin A. There is a considerable difference in texture caused by the ripening process.

Q. How can you tell when jalapeno peppers are mature?

A. Jalapeno peppers are edible and flavorful at all stages of their growth. A fully mature jalapeno pepper generally exhibits small cracks around the shoulders of the fruit. Often a darkened area on the fruit indicates maturity and the initial stages of a color change in the fruit.

Q. Can I save seed from this year's pepper crop for planting in my next garden?

A. Yes. Peppers are self-pollinated and will breed true if seed is saved from this year's garden for planting in next year's garden. Occasional cross-pollination will occur, but this is usually not a problem. Do not save seed from hybrid pepper

plants as these will not breed true and will result in plants exhibiting characteristics different than the desired hybrid.

Q. The foliage on my pepper plants developed spots or lesions and the leaves dropped off.

- A. This could be one or a combination of three foliage diseases: Alternaria leaf spot, Cercospora leaf spot and bacterial leaf spot. In most cases, two or more of these occur simultaneously on the foliage. Control with foliar sprays using a combination of a fungicide and any other copper spray. Begin at the first sign of the disease and continue at one- to two-week intervals during the critical disease periods.

Q. The foliage and fruit of my pepper plants are distorted and small. The leaves have a mosaic pattern.

- A. This could be one of five viruses, transmitted by aphids, that attack peppers. The best control is to buy healthy plants and to follow approved cultural practices and a good insecticide program. It is important to control insects and to remove a plant when infected with one of the viruses. To prevent the spread of TMV (tobacco mosaic virus), do not handle or use tobacco products around the peppers. Wash your hands thoroughly with dish-washing detergent for two minutes or immerse your hands in milk to inactivate the virus.

Q. After the recent rainfall, my plants wilted and died soon after. The inner stems of the plants were dark.

- A. This is Phytophthora stem rot. It is a soilborne fungus that attacks the root systems and stems of peppers. It is particularly severe in areas where water stands around the plant. Plant on a raised bed for optimal soil drainage.

Q. After a summer rain, my pepper plants died rapidly. I found a white growth at the base of the plant. Intermingled with this growth were small, round, bead-like structures the size of a pinhead.

- A. This is southern blight, caused by a soilborne fungus. Crop rotation and deep burial of organic material will help control it. Do not allow leaves to collect around the base of the plant because the fungus will feed on them and later develop on the stem of the plant.

Q. There are small wiggly trails all over the leaves of my pepper plants. What are these?

- A. These trails are caused by leaf miners, a juvenile stage of an insect. Generally, this is not a severe problem in Arkansas. Heavy infestations can defoliate plants and reduce yields.

Q. The very youngest leaves of my pepper plant are twisted and misshaped, and the flowers are not developing into fruit. What causes this?

- A. The plant may be infested with aphids, a small insect that feeds by sucking the cell contents out of young succulent tissue. Use an insecticide to control them.

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FSA6015-5M-7-00RV