

## Garden Peppers

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This NebGuide addresses how to grow sweet, pungent and ornamental peppers.

Peppers are a warm-season annual vegetable crop for Nebraska gardens. They are related to eggplants, potatoes, and tomatoes, all of which belong to the Solanaceae (Nightshade) family. Garden peppers (*Capsicum annuum*) include many different strains. They are quite different and not in the same genus as the plants that furnish the black pepper (*Piper nigrum*) used as a condiment. Tabasco peppers (*Capsicum frutescens*) are the small fruited peppers largely grown in warmer climates and generally processed into hot sauce.

Garden peppers usually are classified as sweet (mild) or pungent (hot). They are available in various shapes, sizes, and colors. Fresh peppers are high in vitamins A and C.

Although peppers are mainly raised for human consumption, they can be grown as ornamentals in containers or outdoors among flowers. The skin colors of peppers include cream, yellow, orange, red, green, and purple.

### Sweet Peppers

Sweet peppers may be blocky, round, or tapered. They are mild in flavor and generally thick-walled. Although most bell peppers change from green to red as they become fully mature, there are now many different colors of peppers available. Among them are sweet pepper varieties that change from yellow to red, purple to red, lavender to red, ivory to yellow, yellow to orange, orange to red, white to light red/pink, and chocolate brown to red.

Blocky (bell) types are one of the most popular for home gardens. They are convenient for stuffed peppers and for use in pizzas, salad, and for eating fresh. The sweet yellow peppers, which include banana types, and the small cherry peppers used mainly for pickling, as well as bell peppers, are all excellent for the home garden.

### Pungent Peppers

Pungent or hot peppers vary from mildly pungent to very hot in taste. They are most commonly used in making chili or similar dishes and are canned or dried.

In general, the green-turning-red types are more pungent than the yellow-turning-red types. Recommended cultivars for Nebraska are found at the end of this publication.

Use care in handling the fruit of hot peppers. Volatile oils in the fruit can irritate and burn. When handling hot peppers, avoid letting your hands come in contact with your face, especially around your eyes and lips. Wearing protective rubber gloves is the best method to prevent skin contact with hot types of peppers. Washing your hands with soap and water after handling these peppers helps reduce irritation.

### Ornamental Peppers

Ornamental peppers are increasing in popularity, especially as potted plants during the holiday season. Plants are available in many forms and have small fruits of various shapes and colors. They usually are purchased when already in fruit.

In the home, the potted plants should be kept in a well-lighted location and the growing medium kept uniformly moist. The ornamental pepper usually requires no fertilizer once it is in fruit.

Although the fruits usually are edible, ornamental peppers purchased in stores are often treated chemically to control pests. In general, it is recommended the fruit not be eaten.

### Purchasing Transplants

Most home gardeners find it more convenient to buy pepper plants rather than to grow their own from seed due to insufficient space, lack of time, and inadequate growing conditions. When purchasing plants, select those that are sturdy, dark green in color and not yet in bloom. Leaves should be fully expanded and free of disease and insects.

Transplants are available in packs of six to eight, in flats of several dozen, or in individual containers. Those in individual containers are transplanted with the least amount of shock because the roots are not disturbed when they are set out in the garden. Plants grown in individual containers may cost more, but they usually are worth it.

## **Growing Transplants**

When growing your own pepper transplants, sow the seeds six to eight weeks before the plants are to be set in the garden. The seeds may be planted into small pots, growing containers or flats, and later transplanted into individual growing containers. Seeds can be germinated directly in individual containers without transplanting to other containers. Pots with more than one seedling should be thinned to a single plant when the first true leaves are fully expanded.

Various commercially prepared mixtures for starting seeds are available. These are generally easier to use than preparing your own mix because they do not require the preparation.

Previously used plastic containers, which may harbor diseases, can be reused by disinfecting them for 20 minutes in a dilute solution of household bleach (2 1/2 teaspoons bleach per gallon of water).

Cover the seeds with 1/2 inch of soil. For good germination, keep the soil moderately moist and at a temperature of 70° to 80°F.

Covering the flats or pots with a sheet of plastic or pane of glass helps maintain the proper moisture and temperature. When the germinating seeds break through the soil surface, remove the cover and water the soil only as necessary to keep it moist to the touch.

Transplant young seedlings into growing containers when the stems have straightened and the first true leaves have opened. This is usually 15 to 20 days after the seed was sown.

When transplanting young pepper seedlings, hold the plant by one of the leaves. Pressure on the stems can cause permanent damage to the seedling.

Young plants should be exposed to full sunlight if possible. Artificial light may be necessary if adequate sunlight is not available. The best temperatures for growing transplants are from 65° to 80°F during the day and 60° to 70°F at night. Growing the plants in a hotbed or cold frame works well.

## **Transplanting to the Garden**

Pepper plants usually require a little extra care than many other types of plants when transplanting them to the garden. They are more sensitive to the transplanting shock. Hardening the plant enables it to withstand the planting shock. The hardening process should begin 10 days to two weeks before planting peppers in the garden. To start the hardening process, move plants in their containers outdoors to a shady spot out of the wind. A cold frame works well for this purpose.

Move the plants into sunlight for short periods each day, gradually increasing the length of exposure. Reduce the frequency of watering to slow growth, but don't allow the plants to wilt.

Transplant the pepper seedlings outdoors when 1) the soil temperature is above 55°F, 2) the risk of frost is low, and 3) the plants have been hardened.

The date when the soil is warm enough and the risk of frost is low varies from year to year and location to location,

especially in Nebraska. Sandy, well-drained soils warm earlier than clay soils, but they also cool more rapidly with a change in air temperature or a cold rain. Peppers are more sensitive to cold wet soils than tomatoes, and the two should not necessarily be planted at the same time. Conditions may be suitable to plant in mid to late May in eastern Nebraska but not before the last week of May or first week in June for western Nebraska.

Protect the plants with paper or plastic covers (hotcaps), newspapers or boxes if there is danger of temperatures below 45°F at night.

Set the plants slightly deeper in the soil outdoors than they were growing in the container, especially if they are leggy. If plants are in peat pots, tear back the peat on one side of the pot. Press the soil firmly around the plant so a slight depression is formed to hold the water. Water the plants immediately.

Distances between plants depend on the size of the mature plant. In general, set the plants 18 to 24 inches apart in rows 3 feet apart.

Pepper plants should not be topped at transplanting time. Topping removes the area of first flower buds and delays first fruit set and fruit harvest.

## **Planting Site**

Plant pepper plants in full sun. Plants growing in partial shade produce less than optimum yields and take longer to produce ripe fruit.

The site should have fertile, well-drained soil. Individual plants may be grown in large containers, but these plants need more attention as the soil tends to dry out quickly.

## **Soil Preparation and Fertilization**

Garden soils can be tilled or spaded in the fall after the harvest season or in the spring before planting. Soil should not be worked while it is wet.

A soil test may be necessary to determine the fertility of your soil. If soil nutrition is low, apply 2 to 3 lbs of a complete fertilizer (ex: 5-10-10, 6-12-12, or 9-16-16) per 100 square feet of garden area when preparing the soil.

A side dressing of 1/4 cup fertilizer in a 2 foot circle around the base of the plant immediately after flowering may be beneficial on soils low in nitrogen. Excessive nitrogen fertilizer tends to force the plants to produce too much foliage and little fruit. Do not overfertilize.

## **Watering**

Peppers need about 1 to 2 inches of water each week. This varies according to temperature, type of soil, rainfall, and whether a mulch is used. Sandy soils require more frequent watering.

Heavy soakings at weekly intervals are better than many light soakings as light, frequent waterings promote shallow root systems. Mulching reduces water loss from the soil.

## Weed Control

Weeds compete with pepper plants for sunlight, nutrients, and water. In the average home garden, weeds are best controlled with cultivation or mulches. In large plantings, herbicides can be used.

Mulches help keep weeds down, reduce water loss, and stabilize soil temperatures. Inorganic mulches, such as black plastic, are available in many garden stores. These inorganic mulches increase soil temperatures and promote earlier growth and production.

Organic mulches such as straw, leaves, or dried grass clippings (burying roots in 3 to 4 inches of green grass clippings can damage the plants) also can be used. Organic mulches should be at least 2 inches deep and preferably 3 to 4 inches deep.

Mulching the soil too early in the season with organic mulches keeps the soil cool, resulting in slow growth and poor fruit set. It also can cause shallow rooting.

Organic mulches generally are not applied around peppers until the soil temperature reaches 70° to 75°F.

## Harvesting

The average yield of pepper plants varies with the variety planted. Bell peppers produce less fruit per plant (seven to 10), but larger fruit than other types.

Sweet peppers are generally harvested when they are full-sized and firm to the touch, but at an immature stage before they ripen to their final color. Fruit left on the vine until completely ripe reduces the total productivity of the plant. However, many individuals enjoy the ripe red, yellow, or green ones, as well as the immature ones.

Cutting instead of pulling is recommended when harvesting pepper fruit from the plant because the branches are brittle and can break easily.

Total yields have been reported to be improved when fruit is harvested without waiting for the peppers to grow to full size. Hot varieties are harvested either immature (green or yellow) or mature (red) for pickling, canning, fresh use, or dry seasoning.

## Problems

Peppers are subject to a number of problems. These include diseases, insects, and problems brought on by weather and other environmental factors.

**Blossom-end** rot of peppers in Nebraska usually results from an irregular or insufficient supply of moisture. This problem is characterized by small areas at or near the tip of pepper fruit that become light brown and sunken. They develop a leathery texture as the fruit reaches full size. It usually is more of a problem on the first fruit.

Mulching helps avoid this condition. Avoid frequent light waterings.

Parasitic disease organisms are not responsible for blossom-end rot, so fungicides are of no value in its control.

**Poor fruit set** can be caused by plants being stunted from being too old when transplanted, having been too dry sometime before or after planting in the garden, too much nitrogen fertilizer, and either too low (less than 55°F) or too high (above 75°F at night or 90°F during the day) temperatures in the garden. Fruit set usually occurs when milder conditions return. Large-fruited types tend to drop many of the flowers that form after several fruits have started to develop on a plant. Certain varieties may fail to set early fruit more frequently than other types.

**Sunscald** on pepper fruit is caused by exposure of the fruit to direct sunlight, especially after being shaded by foliage. Sunscald is characterized by a light-colored area that becomes slightly sunken, with a papery appearance. Maintaining adequate soil moisture is most important. Keep the plants vigorous and healthy or provide adequate moisture to avoid wilting. Good foliage protects the fruit from direct sunlight.

**Insects** occasionally are a problem on peppers in Nebraska. Cutworms may feed on new leaves or cut the stems on small plants. Grasshoppers may nibble on the fruit but are rarely a problem. European corn borer larvae when very small penetrate sweet peppers, usually near the calyx at the top of the fruit. The small worm then feeds and grows undetected inside the pepper, eventually causing the fruit to rot. In Nebraska, this pest can be a problem in peppers in late July and early August. Various natural enemies provide some control, attacking both the egg and the young larvae during the brief time it is exposed prior to entering the pepper. The use of *Bacillus thuringiensis* (Bt) has not been shown to be effective when used in peppers to control this pest. There is little that is of practical use that a home gardener can do to control this pest. Not planting peppers immediately adjacent to corn might be slightly beneficial.

**Diseases** of peppers include seed rot, damping off, virus infection, bacterial leaf spot, and bacterial soft rot. Seed treatment and proper growing conditions can reduce seed rot and damping off. Mosaic, a virus disease, can be avoided by growing mosaic resistant varieties. Bacterial leaf spot is controlled by fungicides, especially copper-based fungicides. Bacterial soft rot occurs as a secondary problem when the fruit is damaged or wounded in some way, allowing the pathogen to become established.

Pepper cultivars recommended for home gardens in Nebraska, along with their days to maturity and fruit characteristics, are listed in *Table 1*.

**Table I. Pepper cultivars recommended for home gardens in Nebraska.**

<b>Sweet Peppers</b>	Jupiter	72 days; large, thick walled, blocky
	King Arthur	68 days; large blocky fruit, 3 to 4 lobes, green to red, strong plant with good disease resistance, sets well in heat
	North Star	62 days; early, continuous set, blocky, 4 lobes, green to red
	Carmen	75 days; horn-shaped fruits, green to red, sweet Italian type
	Giant Marconi	72 days; 8- by 3-inch tapered fruit, green to red, sweet frying-type
	Bell Boy	72 days; blocky, thick walled, 4 lobes
	New Ace	55 days; early, very productive in adverse conditions
<b>Hot Peppers</b>	Cherry Bomb	62-87 days; 2 inches x 2 inches, round to heart-shaped fruits, thick walled, very hot
	Holy Mole	85 days; slender 9 inch fruits, green to brown, Pasilla-type
	Mucho Nacho	70 days; 4 inch hot jalapeno-type fruits, thick walled, vigorous plants
	Numex Joe E. Parker	70-95 days; 6-8 inches, thick flesh, bright green fruits, mild Anaheim-type
	Super Chili Hybrid	75 days; hot cayenne-type, 2.5 inches long, prolific, dries well, short, spreading plant
	White Bullet	80-90 days; 1 inch bullet-shaped fruits, green to gold, very hot Habanero type

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