

# Peppers

Peppers were domesticated in Mexico. As early as 6,000 years ago, red peppers were used in tropical South America as a spice to disguise the taste of bland or unpalatable food. Chili peppers are called **chile** in Mexico and Central America and **aji** in South America and the West Indies. Columbus took peppers back to Europe where they rapidly became popular.

Pepper cultivars, which number in the hundreds, are usually classified as sweet or hot. Peppers also vary by fruit shape, flavor, pungency, color, and culinary use. Pickling, grinding, roasting, drying, and freezing can influence flavor.

All bell peppers belong to the species *Capsicum annuum*. Hot peppers may belong to several other species. The *C. chinense* cultivars Habanero and Scotch Bonnet are among the hottest.

## Pepper Types

| Pepper type          | Size   | Shape                 | Wall  | Use                     |
|----------------------|--------|-----------------------|-------|-------------------------|
| Anaheim              | large  | long, thin tapering   | thin  | fresh                   |
| Ancho                | large  | long, blocky          | thin  | fresh                   |
| Bell or Sweet        | large  | blocky, few elongated | thick | fresh, cooked           |
| Cayenne              | medium | very thin, tapering   | thin  | fresh, dried, processed |
| Cherry               | small  | round, flattened      | thick | processed               |
| Cubanelle            | large  | irregular, blunt      | thin  | processed, fresh        |
| Jalapeno             | small  | oblong, blunt         | thick | processed, fresh        |
| Ornamental           | small  | slim                  | thin  | processed, fresh        |
| Pimento              | large  | heart-shaped          | thick | processing              |
| Wax or Hungarian Wax | medium | oblong                | thick | fresh                   |

## Bell Pepper Cultivars

Bell peppers are large, blocky, 3- or 4-lobed fruit that taper slightly at the bottom. Most are sweet and dark green. Depending on the cultivar, the fruit becomes red, yellow, orange, or some other color at maturity.

| Bell peppers             | Season     | Color at maturity | Other  |
|--------------------------|------------|-------------------|--|
| Bell Boy                 | 70–72 days | green to red      | Thick-walled fruit; TMV resistant                  |
| Bell Captain             | 72 days    | green to red      | Do well in stressed conditions; TMV tolerant       |
| Big Bertha               | 72 days    | green to red      | Widely adapted proven performer; TMV tolerant      |
| California Wonder        | 75 days    | green to red      | Good for stuffing                                  |
| Jupiter                  | 74 days    | green to red      | Consistently large size; TMV resistant             |
| Keystone Resistant Giant | 80 days    | dark green to red | TMV resistant                                      |
| Lady Bell                | 71 days    | green to red      | TMV resistant                                      |
| North Star               | 63 days    | green to red      | Sets fruit under adverse conditions; TMV resistant |
| Yolo Wonder              | 75 days    | green to red      | Average size, thick-walled fruit                   |

TMV = Tobacco Mosaic Virus

## How hot is hot?

The pungency or heat of a pepper depends on seven closely related alkaloids or capsaicinoids. In the early 1900s, Wilbur L. Scoville devised a test to determine the relative hotness of different peppers. Capsaicin from a known weight of pepper was extracted with alcohol and mixed in various concentrations with sweetened water. Human tasters were asked to identify the point at which water neutralized the hotness. The volume of water required for each sample was assigned a rating in Scoville units—the larger the number, the more water needed and the hotter the pepper. A high-pressure liquid chromatography test replaced this technique in the early 1980s, but the measurements are still expressed in Scoville units. The following peppers are listed from most hot to least hot, according to Scoville units.

## Find it on the thermometer!

Habanero

- Caribbean Red..... 100,000–445,000
- Red..... 80,000–285,000
- Scotch Bonnet..... 80,000–260,000

Jamaican Hot..... 100,000–200,000

Chiltepini..... 50,000–100,000  
Santaka  
Thai

Cayenne..... 50,000–70,000  
Charleston Hot

Piquin..... 30,000–50,000  
Aji  
Cayenne  
Tabasco

Thai Dragon..... 35,000–45,000

De Arbol..... 15,000–30,000

Serrano..... 5,000–23,000

Yellow Wax..... 5,000–15,000

Jalapeño..... 2,500–5,000  
Mirasol

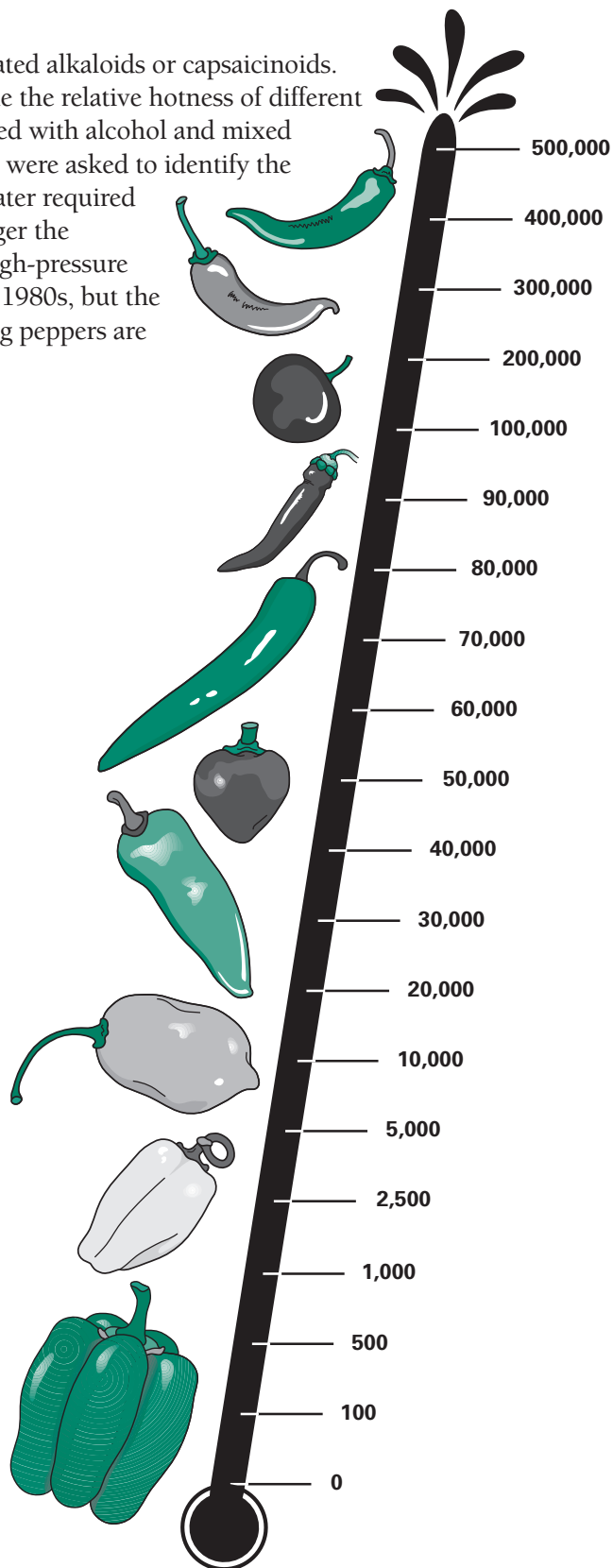
Cascabel..... 1,500–2,500  
Rocotillo  
Sandia

Ancho..... 1,000–1,500  
Chilaca  
Espanola  
Pasilla  
Poblano

Anaheim..... 500–1,000  
Big Jim  
New Mexico

Cherry..... 100–500  
Mexi-Bell  
Peperoncini

Bell..... 0  
False Alarm  
Pimento  
Sweet Banana  
Sweet Italian



Adapted from *Peppers: Safe Methods to Store, Preserve, and Enjoy*. University of California publication 8004. 1998. See <http://anrcatalog.ucdavis.edu/>.

## Planting

Pepper plants grow best in well-drained soils of moderate fertility. The plants are not particularly sensitive to soil pH, but best results are obtained when soil is in the 6.0 to 6.8 range.



Peppers are a warm-season crop and need a long season for maximum production. Temperature has a large effect on the rate of plant and fruit growth and the development and quality of the red or yellow pigments. Ideal temperature for red pigment development is 65–75°F. Above this range the red color becomes yellowish. Below it, color development slows dramatically and stops completely below 55°F.

Pepper plants can be purchased at garden centers or started indoors 6 to 8 weeks before the intended outdoor planting date. Transplant peppers into the garden after the danger of frost is past. In central Iowa, mid-May is the suggested planting date. Gardeners in southern Iowa can plant one week earlier, while those in northern areas should wait an extra week. The last practical date for planting peppers is approximately June 20.

Water plants thoroughly after transplanting.

## Spacing

Space plants 18 inches apart within the rows; rows should be spaced 24 to 30 inches apart.

## Estimated yield

Average yield with good management practices should be approximately 80 pounds per 10-foot row. Yields will vary depending on the type and cultivar of pepper.

## Fertilizing

It is generally safe to apply 2 to 3 pounds of 5-10-5 per 100 square feet to the garden area where peppers will be planted. Conduct a soil test for specific phosphate (P) and potash (K) recommendations.

After transplanting, fertilize the pepper plants with a starter fertilizer solution. A starter fertilizer solution can be prepared by following directions on a water-soluble fertilizer or by dissolving 2 tablespoons of an all-purpose garden fertilizer, such as 10-10-10, in one gallon of water. Give each plant 1 to 2 cups of the solution.

## Potential problems

### Blossom end rot

Water-soaked areas that develop near the blossom end of the fruit characterize blossom end rot. The affected tissue desiccates, becoming brown and leathery. Affected fruit may ripen prematurely. Secondary fungi and bacteria may colonize the dead tissue, causing it to rot. Blossom end rot is caused by a calcium deficiency in developing fruit. It occurs in fields with low or moderate soil calcium levels. Fluctuating soil moisture due to over watering or drought, high nitrogen fertilization, and root pruning during cultivation also can cause blossom end rot.

### Poor crop

Flowers of sweet bell peppers will drop off when night temperatures are below 60°F or above 85°F. Maximum set of sweet bell peppers occurs at constant temperatures of 60–70°F. Temperature tolerance for sweet bell peppers varies with the cultivar. Hot peppers usually set well in warm weather. An adequate moisture supply during flowering and fruit set also is important. Mulching helps conserve soil moisture.

### Sunscald

The heat of the sun may burn the side of the fruit exposed to the sun. Initially, a soft, light-colored area develops on the fruit. Later the area dries, becoming white and paper-like in appearance. The risk for sunscald can be reduced by controlling leaf diseases that may defoliate the plants, and by lightly fertilizing plants to promote growth.

## Harvest and storage

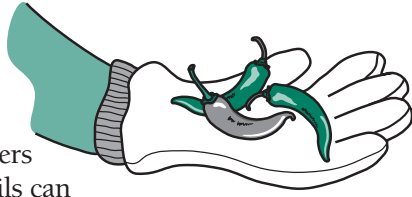
Hot peppers and bell peppers can be harvested in the immature green stage or when fully ripe. They can be eaten fresh, used in sauces, pickled, frozen, or dried.

Bell peppers are usually harvested when large and firm in the immature green stage. They also may be allowed to fully ripen to red, yellow, orange, purple, or other colors. Fully ripe bell peppers are slightly sweeter and have a higher vitamin content than do the immature green peppers.

Fresh peppers may be stored for up to 3 weeks in cool, moist conditions (45 to 50°F and 85 to 90 percent relative humidity).

Bell peppers and hot peppers can be frozen or dried for later use. Hot peppers also can be pickled.

Wearing gloves and working in a well ventilated room is recommended when working with hot peppers because their volatile oils can cause burns or irritate sensitive skin.



Avoid touching your eyes and other sensitive areas after handling hot peppers.

### For more information

Additional information about vegetable gardening and other horticultural topics is available from local extension offices and from these Web sites:

#### ISU Extension Distribution Center

[www.extension.iastate.edu/store](http://www.extension.iastate.edu/store)

#### ISU Extension Food Preservation Resources—

[www.extension.iastate.edu/healthnutrition/food/preservation/resources.htm](http://www.extension.iastate.edu/healthnutrition/food/preservation/resources.htm)

#### ISU Extension Horticulture—

[www.yardandgarden.extension.iastate.edu](http://www.yardandgarden.extension.iastate.edu)

Questions also may be directed to ISU Extension Hortline by calling 515-294-3108 during business hours (10 a.m.–12 noon, 1 p.m.–4:30 p.m. Monday–Friday).

If you want to learn more about horticulture through training and volunteer work, ask your ISU Extension office for information about the ISU Extension Master Gardener program.

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