

## Peppers

By Eldon Everhart, Cindy Haynes, and Richard Jauron

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* varieties Habanero and Scotch Bonnet are considered the hottest.

### Cultivars

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

#### Sweet peppers

Bell Boy F1	70–72 days
Bell Captain F2	72 days
Big Bertha F1	72 days
California Wonder	75 days
Jupiter	74 days
Keystone Resistant Giant	80 days
Lady Bell F1	71 days
North Star F1	63 days
Yolo Wonder	75 days

#### Season

70–72 days
72 days
72 days
75 days
74 days
80 days
71 days
63 days
75 days

#### Color at maturity

green to red
dark green to red
green to red
green to red
green to red
green to red

#### Other

Thick-walled fruit. TMV resistant
Do well in stressed conditions. TMV tolerant
Widely adapted proven performer. TMV tolerant
Good for stuffing
Consistently large size. TMV resistant
TMV resistant
TMV resistant
Sets fruit under adverse conditions. TMV resistant
Average size, thick-walled fruit

#### Pepper type

Bell or Sweet
Pimiento
Ancho
Anaheim
Cayenne
Cubanelle
Jalapeno
Ornamental
Cherry
Wax or Hungarian Wax

#### Size

large
large
large
large
medium
large
small
small
small
medium

#### Shape

blocky, few elongated
heart-shaped
long, blocky
long, thin tapering
very thin, tapering
irregular, blunt
oblong, blunt
slim
round, flattened
oblong

#### Wall

thick
thick
thin
thin
thin
thin
thick
thin
thick
thick

#### Use

fresh, cooked
processing
fresh
fresh
fresh, dried, processed
processed, fresh
processed, fresh
processed, fresh
processed
fresh

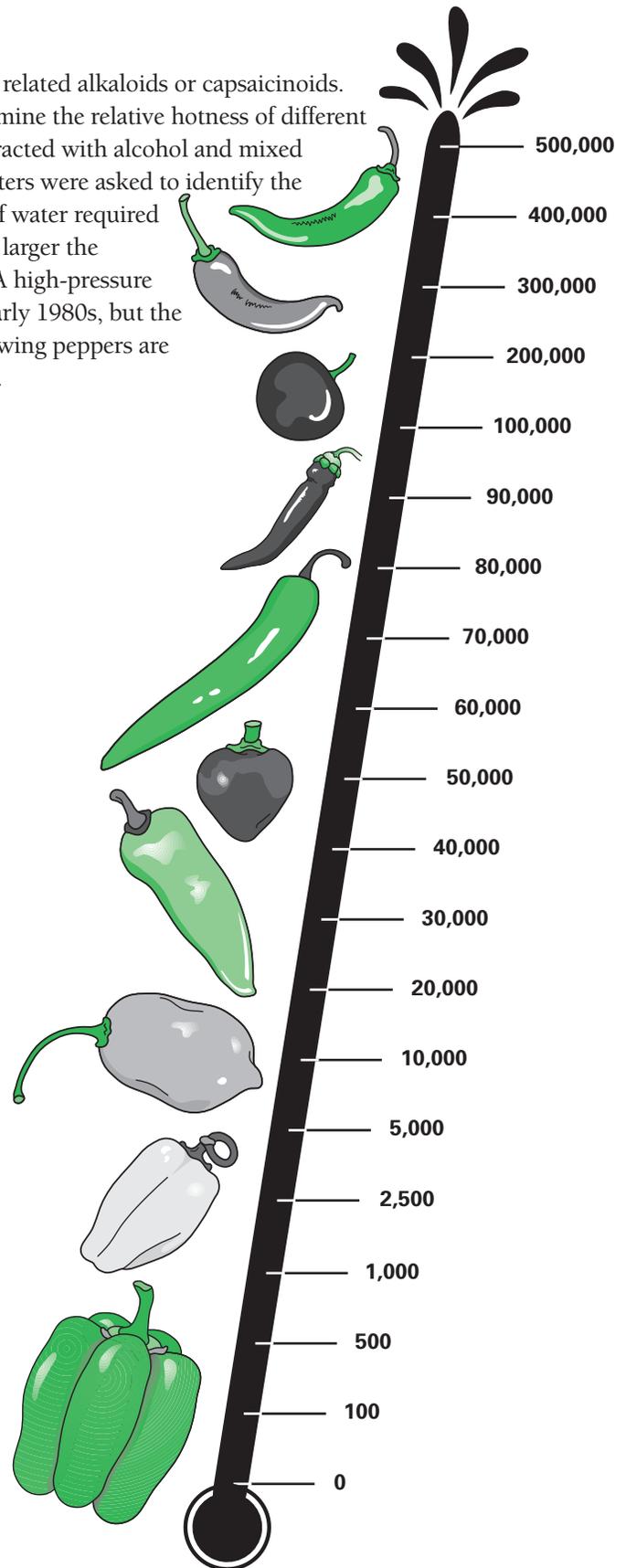
TMV = Tobacco Mosaic Virus

## 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. The complete publication is available at <http://anrcatalog.ucdavis.edu/>.

## Planting

Pepper plants grow best in warm, well-drained soils of moderate fertility. The plants are not particularly sensitive to soil pH, but best results are obtained 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, May 15 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 in rows 24 to 30 inches apart.



## Estimated yield

Average yield with good management practices should be approximately 80 pounds per 10-foot row.

## 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 P and K recommendations.

After transplanting, feed the pepper plants with a starter fertilizer solution. Dissolve 2 tablespoons of a 5-10-5 fertilizer in a gallon of water, then pour 1 cup of the solution at the base of each plant.

## 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 turn dark and 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

Blossoms of sweet bell peppers are sensitive to temperature extremes. Flowers will drop off when night temperatures are below 60° F or above 85° F. Maximum set of sweet bell peppers occurs between constant temperatures of 60–70° F. Temperature tolerance for sweet bell peppers varies with 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).

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

Contact your local Iowa State University Extension office for additional information or copies of the following publications.

*Canning Vegetables*, PM 1044  
*Container Vegetable Garden*, PM 870B  
*Freezing Fruits and Vegetables*, PM 1045  
*Garden Soil Management*, PM 820  
*Organic Mulches for Gardens and Landscape Plantings*,  
RG 209  
*Planting a Home Vegetable Garden*, PM 819  
*Preserve Food Safely*, N 3332  
*Questions about Composting*, RG 206  
*Small Plot Vegetable Gardens*, PM 870A  
*Starting Garden Transplants at Home*, PM 874  
*Watering the Home Garden—Use of Trickle Irrigation*,  
PM 823  
*Where to Put Your Vegetable Garden*, PM 814

Additional information also is available from these Web sites.

## ISU Extension publications

<http://extension.iastate.edu/Pubs>

## ISU Horticulture

<http://www.hort.iastate.edu/>

Questions also may be directed to the ISU Extension Hotline by calling 515-294-3108 during business hours (8 a.m.–12 noon, 1 p.m.–5 p.m. Monday–Friday).

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