

Cucumbers

One of the joys of the summer garden is slicing up a cucumber just plucked off the vine and savoring that first crisp, cool bite. Well, it's a joy when the cucumber tastes the way it should: with that sweet, refreshing flavor that alludes to a clear mountain spring. But sometimes, for no apparent reason, one will taste bitter.

How does that happen, and more important, what can you do about it? If you follow these tips to minimize a cucumber's greatest enemy - stress - you'll prevent bitterness, as well as most of the other problems that may have marred your cuke harvest in the past, such as pests and diseases. And I promise that this year you'll enjoy the coolest, tastiest cucumbers that no money can buy.

Secrets of Growing Tasty Cukes

Some cukes start out bitter, but some become bitter because of conditions in their environment- many of which you can control. (For an explanation of what makes cucumbers bitter, see "The Bitter Truth," below.) Plants that are stressed are more likely to become bitter; *how* bitter depends on the severity of the stress. Stress in a plant is most often caused by insufficient and uneven moisture, but temperature extremes and poor nutrition can also play a part. You can minimize stress and maximize flavor if you:

1. Keep them hydrated. Provide plants with plenty of moisture, especially around the time the plant is flowering and fruiting. Any water stress during this period of rapid growth causes the levels of bitter-tasting compounds to rise. Cucumbers are vigorous growers and therefore need between 1 and 2 inches of water per week, depending on the weather and the characteristics of your soil. The key is to keep the soil slightly moist at all times. Water deeply about once or twice a week- more often if you're gardening in sandy soil.

2. Mulch. You can further reduce water stress by mulching plants with an organic mulch. Mulch helps to conserve and moderate moisture levels while blocking out weeds. Plastic mulches can be applied at planting time, but wait until summer or after the soil has warmed to above 70 degrees before applying organic mulches, such as straw.

3. Regulate the temperature. Cucumbers like warm conditions, but growing cool and tasty cukes in the heat can sometimes be a challenge. In fact, high temperatures not only affect fruit quality; they can also affect fruit set by causing the plant to produce a higher ratio of male flowers. "Cucumbers are really sensitive to high heat," says horticulturist Emily Gatch, greenhouse and pathology coordinator with New Mexico-based Seeds of Change. "It can be really hard on plants if temperatures are consistently in the mid-90s." If you're growing cucumbers in a hot climate, Gatch recommends providing plants with filtered afternoon shade to help cool things down, either by strategically planting taller crops at the southern end or by adding a shade cloth to block 40 to 50 percent of the sunlight.

4. Give them sunlight and good soil. For the best-tasting fruit and optimum yields, grow plants in a sunny spot and in warm, fertile, and well-drained soil rich in organic matter. Raised beds are ideal. Cucumbers require a soil pH between 6.0 and 7.0. Wait to sow seeds or set out transplants until after all danger of frost has passed and the soil has warmed to at least 60°F. An unexpected frost will kill plants, and the vines grow slowly and become stressed in cool conditions. You can start seeds indoors three to four weeks before your anticipated planting date outdoors. Be careful not to disturb roots when transplanting.

5. Fertilize. Cucumbers thrive in light, friable soil. Several inches of organic matter worked into the soil prior to planting helps achieve that goal. Plants are heavy feeders, so be sure to feed the soil with rich compost or aged manure. After the vines develop runners and the first flowers appear, follow up with a side dressing of compost, aged manure, or organic fertilizer. If the leaves are yellowish, the plants need more nitrogen. Make room. Giving plants the space they require is just one more ticket to a stress-free

environment. Grow trellised plants 8 to 12 inches apart. Hills with one or two seedlings should be spaced about 3 feet apart, with rows 4 to 5 feet apart. Space bush varieties 3 feet apart in all directions.

6. Banish weeds. Keep your cucumber patch and the area around it free of weeds. Some types are hosts for bacterial wilt disease, which is spread by cucumber beetles. Intense feeding by these beetles can kill a plant, and they're attracted to stressed plants- all the more reason to keep your plants healthy and happy.

7. Cover up. Row covers, hotcaps (or plastic milk cartons with the caps removed), and plastic tunnels are great for getting plants off to an early start. And row covers not only help plants grow faster and flower sooner, they also protect plants from pest insects. Just be sure to remove any covering once plants start to flower.

Reap the Harvests

Depending on the variety, cucumbers are ready for harvest 50 to 70 days from planting. The more you pick cucumbers, the longer they'll produce. After all, they do belong to the squash family, and certainly zucchini has taught us all a thing or two about letting fruits get too big. You can expect longer harvests of top-quality cukes on productive plants if you pick the fruits frequently and before they get too large.

- **Size matters.** The size at which you harvest depends on the variety grown. For optimum taste and texture, American slicers are generally best when harvested at 6 to 8 inches long; Middle Eastern types such as 'Amira' at 4 to 6 inches; most picklers at 3 to 5 inches; and Asian varieties at 8 to 12 inches. The Middle Eastern types (also known as Mediterranean cucumbers) are shorter and have a blockier shape than American varieties. Asian varieties like 'Suyo Long' and 'Tasty Jade' are long and slender, reaching as long as 15 inches in length. The Middle Eastern types have a bit more flavor than Asian varieties, which are very mild. Both types have very tender skin.
- **How to harvest.** Some people harvest their cukes by turning the fruit parallel to the vine with a quick snap. But unless you're skilled at making such a clean break, a pair of scissors or pruning shears might prove a better bet. Simply grasp the fruit and cut the stem 1/4 inch above it.
- **The bitter ends.** If fruits taste bitter, no need to panic. "Bitterness concentrates in the stem end and skin and doesn't penetrate the entire fruit," says horticulturist Tracy K. Lee of W. Atlee Burpee & Co., in Warminster, Pennsylvania. "Simply peel the fruit and cut off the stem end by about an inch or two to reduce the bitterness."

The Bitter Truth

Built-in bitterness. Most cucumber plants contain compounds known as *cucurbitacins* ("kyew-ker-BIT-a-sins") that cause fruit to taste bitter. At low levels, you aren't likely to detect them. But high levels of cucurbitacins produce extremely bitter fruit- so bitter that eating it would cause a riot in your stomach. Cucurbitacin levels increase when a plant is under stress. Your mileage may vary. The concentration of these compounds varies from plant to plant, fruit to fruit, and even within the individual fruit itself. The ability to taste cucurbitacins also varies from person to person. Even insects have varying preferences for cucurbitacins- the compounds attract cucumber beetles but repel other insects, such as aphids and spider mites.

- **An antibitterness gene.** Cucurbitacins are found in most cucurbits, but some cucumber varieties possess a gene that inhibits their formation. "The bi gene causes the entire plant to be bitterfree," notes Todd C. Wehner, Ph.D., professor of horticultural science and plant breeder at North Carolina State University. "Bitterfree plants always produce bitterfree fruit, even under stress conditions," he adds.
- **Bitterfree types.** Varieties that possess the recessive bi gene include European and Dutch greenhouse cucumbers- those long, very slender, seedless specimens typically sold shrink-wrapped with plastic to protect their thin skins. 'Marketmore 97', a vining slicer variety, also has the bitterfree gene.
- **Burpless cucumbers.** What makes a cucumber "burpless" is open to debate. Some researchers have suggested that a burpless cucumber contains less of a burp-causing compound; some say

it's the seeds that cause people to burp, and therefore the English/Dutch long hothouse-type cucumbers are also burpless. Sometimes burpless is used as a marketing term for Asian varieties of cucumbers. Burpless varieties include those two categories plus varieties like 'Tasty Green', 'Sweet Success', and 'Big Burpless Hybrid'. Although burpless varieties are bred to produce fewer cucurbitacins, they don't have the gene that would make them bitterfree, so they could produce more cucurbitacins if growing conditions become unfavorable.