

Tomato Growing for Beginners

About Tomatoes

Tomatoes are a tropical fruit first found in the rainforests of Central and South America. In nature, they creep along the ground and reproduce when the fruit matures, breaks open naturally, or attracts animals and birds, which carry the seeds through the forest in their droppings.

The first tomatoes in the new world found their way to Spain in the 16th and 17th centuries. Wild plants were dispersed across Europe and eventually into Asia, as far as Japan and Siberia. Since all of these plants were genetically different from each other they adapted naturally to different climates and to produce fruit of different sizes and colors. In the middle ages tomatoes were first thought to be poisonous, then considered an aphrodisiac. They are for me, at least.

Heirloom tomatoes are the varieties that evolved over time without genetic intervention. They do not cross-pollinate, so the original varieties remain virtually the same. Sizes range from the size of a pea to the size of a small pomello, and colors range from pink to red, to nearly black, green, white, plain and striped. Some are slightly flattened and have ribs like a pumpkin.

Tomato Anatomy

Tomatoes are "monopodial," meaning that they grow from the roots straight up rather than producing siblings around them through the roots or rhizomes. Leaves are similar but can be thin or broad. The root system is fragile, which is important to remember when transplanting into larger containers. The root system tends to be somewhat compact. Leafy branches appear as the plants grow into maturity, and flowers appear near their extremities.

You will notice that the main stem of most tomatoes is covered with fine hairs. If they contact soil or other medium, they potentially become roots, which helps plants to become more vigorous when they creep along the forest floor. When you understand how to use these hairs, you will grow stronger tomatoes.

Heirloom tomatoes do not rely on insect pollinators. They are self-pollinating, although they sometimes need a little help to loosen the pollen. A light breeze is usually enough. If you are growing in a place where the air is very still, you may have to tap the flowers gently around the stems when they are fully open. I know one tomato farmer who uses an electric toothbrush. He places the back of the toothbrush against the stem and the vibration loosens the



pollen so that fruit will grow. For me gentle breezes are quite enough. The plants will die when the fruit is fully ripe.

How I Grow Tomatoes

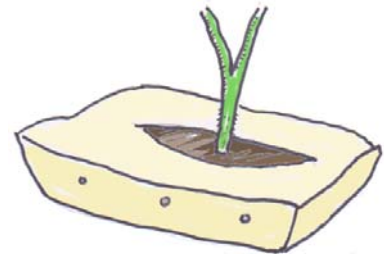
I sow seeds in small containers indoors. I fill the containers half full with a sterile potting medium or compost. (I bake it in an oven for an hour or so in order to kill anything living in the medium.) Seeds usually germinate within seven days. Some varieties germinate strongly. Others are more difficult. If 80% of my seeds germinate I am usually happy. Some are only 15%-20%.

Once seedlings are about 10cm tall I fill the container with medium to the top. This encourages the "hairs" on the main stem to produce more roots. You will have better root growth if you do this when the plant is already growing strongly.

Tomato seedlings love to be touched. I brush my hand gently over the tops of the plants at least once a day. The plants will thank you by releasing a volatile oil in the foliage that is a bit stinky. As you become an accomplished tomato grower you will learn to associate the smell with beautiful fruit and enjoy it.

When plants are 18 to 22 cm tall I move them into a black plastic seedling bag to give the roots a bit more room to develop.. These have square bottoms and holes for oxygen and to help excess water to escape. At this point, the plants go outdoors during the day in bright, filtered light for about a week. After that they can stay outdoors permanently. Depending on the natural height and strength of the plant, you may need to use bamboo stake to keep the plant from flopping over.

Once they are 30 to 40cm tall, they are teenagers and are ready to go into a bag of compost. I use compost because natural soil in a garden is full of insects and pathogens that kill plants. Compost is 95% free of nasty things that kill tomato plants. The bags provide a protective environment for the roots that helps keep them moist. If you suspect that the medium in the bag is not 100% clean you can pour a liter of boiling water into the bag the day before repotting.



Place a bag on the ground (or even on concrete, for that matter) and cut an opening in the top roughly 50% of the length of the bag. Then "stab" the bag two or three times on each side to help excess water to drain. Water the medium (gently) the day before you transplant the teenagers. This will make the contents of the bag easier to work with when it is time to put the plant into the bag. Although it is not necessary, you can use boiling water to make absolutely sure there is nothing else living in the bag.

Place the bags where you plan to grow them. It is not a good idea to move bags after plants have been repotted in the bags since this can cause damage to the roots that may kill the plants. If you are growing several or many plants, they should be placed at least 1 meter apart in a place that gets at least 300 degree sun during the day and allow you to walk around them.

Do not remove the tomatoes plants from the small bags they have been growing in. Instead, use a sharp knife or scissors to make long openings on all four sides of the bag. (Careful of the roots!) Next, push the compost to the sides to create a "well" about the size of the bag. The well should go all the way down to the very bottom of the bag since you want to bury the plants



as deep as possible. Gently, *gently* put the smaller bag with the plants into the compost. After you have done this you can add some water so that there is no air gap between the compost and the outside of the bag. If you use Vitamin B1 this will help plants to avoid transplant shock. I prefer to use a product called *Superthrive*, which is a mixture of vitamins and plant hormones. Unfortunately, you can buy this product only in the U.S. But you can find it on Amazon.com if you know people who can carry it to you.

Next, sit back and watch your tomatoes grow.

Depending on temperature and location your plants may need water daily or every 2 or even three days. Excessive water does not make health tomato plants. To test moisture inside the compost bag put a finger into the holes on the sides of the bag. If it is slightly moist the plant does not require watering. If it is dry or sandy, you need to water. When plants are dry, I water them gently for 3 seconds each, wait for a minute, then water for about five to seven seconds. If the soil is very dry, the water will just run out the sides of the bag. If the soil is slightly moist it will retain more water. Do not flood the compost bag.

Feeding

I feed my tomato plants only twice. I give them a high nitrogen or balanced plant food soon after they go into the smaller bag. Plant food is described with numbers, like 0-5-5 or 10-10-10- or 30-10-10. This is the balance between nitrogen, phosphorous, and iron (usually in the form of potash). Plants love nitrogen when they are growing vigorously. However, nitrogen restricts blooming. Tomato plants that do not produce flowers will not have tomatoes! About one week after plants have moved into compost you can give them a single feeding of low- or no-hydrogen plant food, like 0-10-10. If your environment is so hot that your plants need daily water, you can give them a second feeding after about two weeks.

The Joys of Epsom Salts

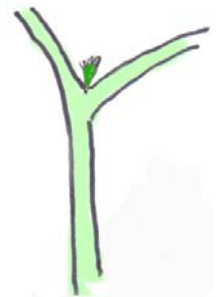
The stuff you add to bath water for aches and pains is actually something that tomatoes enjoy. While it is not a plant food, it is a mineral additive that helps make tomatoes stronger and greener, which is beneficial for plants grown under full sun. I give my plants a maximum of two doses—when they are taller than the size of first container they grow in, then again soon after you move them into the large bag. Use 1 tablespoon for each liter of water. Try not to get any of the solution on your plants' foliage.



Some tomato growers add calcium to the soil. I am not sure why, but why not? I crumble egg shells into the bag I use for seedlings. This will help prevent "blossom rot." You can also buy commercially-prepared calcium supplements from the company named below.

"Grooming"

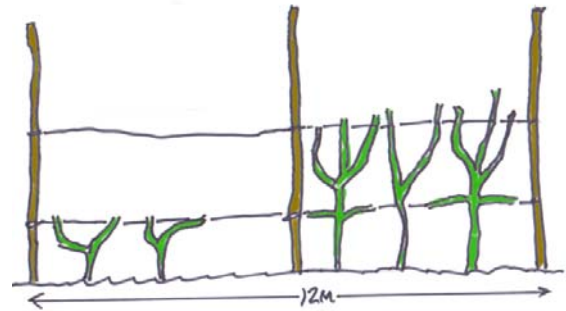
Stronger plants produce more tomatoes. By grooming plants once a week you will make sure your plants put their energy into the fruit-producing parts of the plant. You will begin to see smaller branches begin to grow from between more developed branches. You can pinch these off since they will never be mature enough to produce fruit. You can also remove any small growths or leaves from the



bottom of the plant.

Before long your plants will need help if you want them grow up and out rather than along the ground, as they would naturally. This means creating a support system that you can tie branches to in order to support heavy fruit.

This support system varies from grower to grower and continent to continent. I grew up in an area where we grew grapes for wine, so we grew our tomatoes with the same kind of support system.



The easiest system is to use a 2meter tall piece of strong bamboo, wood or steel secured in the ground. PVC pipe does not work well because it bends. The best way to do this is to dig a hole, position the poles vertically, and fill the hole with quick concrete. Poles should be spaced about every 12 meters, with three plants between them. Stretch a piece of string between one poll and the next (you will have to tie a knot at each poll) around the top of the plants. Loosely fasten branches to the string. Twist-ties are easiest. I am cheap so I use plain string. The advantage of this system is that you can spread branches out horizontally, which gives them more sun. This should result in more fruit.

There are plenty of alternatives, including steel "tomato cages," which are probably not available here. Bamboo poles planted deep in the ground on three sides of each plant. However, this takes more bamboo or wood, and more time to construct. You could put a piece of bamboo across the top of the structure shown above and hang string from the top to tie each plant to. In terms of time, flexibility and benefit, however, the idea illustrated above is easiest and most economical.

Rain: Tomatoes can withstand light showers but not downpours. You can make a simple covering for your plants using a light weight steel wire mesh (from Home Pro) and transparent plastic sold in rolls (mine comes from Robinsons). Actually, this can be attached to the tops of the poles you use to help your plants grow vertically.

Pests

There are all kinds of bug out there waiting to destroy your tomato crop. The biggest walk on two legs and would rather eat someone else's tomatoes than grow their own. We can't blame them for that, but if you can grow your plants out of sight or in a fenced area, you will have to deal with fewer of these particular pest.



You can avoid having problems with most soil-borne pests, like nematodes, fungi, ants, beetles and some kind of worms will be avoided if you grow your plants in a bag of compost. Birds and rodents may also enjoy tomatoes as much as you do so protect your crop from them as best you can. If you are growing plants in an area adjacent to a large forest, your tomatoes may attract deer.

The biggest enemy for tomatoes is the mealy bug, shown above. These will establish themselves in the soil long before you see them on plants. Once you see them on plants it may already too

late, but you may be able to recover. However, the best way to control pests is to avoid them from becoming established your plants in the first place.

If you see ants dashing up and down the main stems of your plants, it generally means they are taking some kind of pest from the soil and making their own farm on your plants. Ants do not eat mealy bugs, but they do eat the sweet, sticky substance the insects make. If you see ants, do something quickly.

I make a "tea" of bird chillies (one package), young ginger (one very large piece), and garlic (two heads). I chop these coarsely, then put them in my food processor and run the machine until I get a paste. You may need to add a bit of water. Put all of this in a large container (like 1.5 liter Ball brand glass jar), fill the container with boiling water, and let it steep all night until you have a tea.

You need to remove the solids with a wire strainer, the strain the liquid again through cloth. Don't throw away the remaining pulp.

To the strained tea, add half a bottle of rubbing alcohol and half a teaspoon of dishwashing liquid (baby diaper laundry soap is better). You can spray this on your plants as a deterrent or to kill any pest you have already but may not see. You can pour it into the compost bag to kill anything that might be lurking there.

Mealy bugs *hate* coffee grounds. If you drink coffee and make it yourself with ground beans, save the grounds. I mix mine in a big plastic jar added to the pulp from the tea. I keep it in my freezer since it will go bad if you do not. I add a big spoon full of this mixture to the potting medium when I move seedlings into the first plastic bags.

I have seen people in Italy make strips of newspaper about 2cm wide, dip them in water, and wrap them around the lower stems of their tomato plants. I have heard of this in America a couple of times—mostly among Italian-American tomato growers. They swear that it keeps bugs from attacking from the soil. I have used wet newspaper spread across the soil as a weed control when growing other things outdoor.

Another organic pesticide comes from a common herb grown in Thailand. My assistant says it is called "Neem," which is a plant extract. The label appears on the right. It is very inexpensive and commonly available in shops that sell supplies for home gardening. (I go to the place just past the parking entry/exit to O-Tor-Kor market, which is also a great place to buy bags of compost. (I buy them from the lady next to the parking exit because she has strong guys to stuff them into taxis and usually gives me a free bag or two when I buy eight or ten.) Buy the large size bottle. It's very inexpensive.

You can add this to the spray described above, and also saturate your soil with it. It is not toxic to humans or pets. However, it prevents insects from developing an exo-skeleton (shell), which means they will die before they become a problem. You can start applying both the tea and this herbal pesticide as soon as plants are 10-12 cm tall, and repeat every 7 to 10 days



If you begin to see insect infestations that you cannot control with the solutions described above, you may have to resort to a non-organic pesticide. I have had very good results with the stuff shown above (with "FMC" on the label). You need to cover your skin and eyes, and wear gloves and a mask when you handle and apply it. It is toxic to humans, fish and pets, so be very cautious if you find it necessary to use it. In the worst cases I have had to apply this pesticide only once to both the foliage and potting medium. Try to do this before you have fruit. It is not systemic, but it could contaminate tomatoes unless they are washed very, very thoroughly.

A problem I have never experienced but one I am told is common in Thailand is the Tomato Pin Worm. These tiny (1/2 cm) worms drill through the skin of tomato fruit, eat the inside of the tomato, then lay their eggs. Most agricultural officials will say that the only way to control them is with a broad spectrum insecticide which is a last resort. If the insecticide is systemic, that means your tomatoes will be filled with insecticide. I have also heard that there is a natural way to control them with *Bacillus thuringiensis*, a natural bacterium that is lethal to pin worms and a few other pests. You can buy this as well as plant foods and other pest controls online from <http://www.thaigreenagro.com/>

Free Plants (when I have them)

I suppose I am the Johnny Appleseed of tomatoes in Thailand. I have access to a seed bank of hundreds of heirloom tomato seeds in Northern California. I have been experimenting for ten years to find the varieties that are happy in our climate. So far I have grown about 50 varieties, with varying results. I can normally produce about 100 seedlings per month. I am happy to give plants to urban gardeners in Bangkok, provided you agree with my conditions:

- You have to take at least ten plants.
- You must have the right conditions—at least 300 degrees of full sun per day, clean water, and little or no wind. Roof-tops are possible if you create an enclosure or barrier. Balconies are usually not sunny enough. You also have to agree to grow them using my method—no hydroponics and not in the ground.
- Each plant comes with a numbered tag, which needs to stay with the plant.
- You have to agree not to sell fruit unless you are a commercial grower, in which case there are different terms and conditions. I will be available to answer questions and even make house calls if necessary.
- I would like to have 25% of the fruit you grow in return so I can enjoy decent tomatoes myself, and also establish a seed bank here. I would use some to show people who have never tasted a real tomato what they are missing.

If you turn out to be a talented grower and can handle 20+ plants, we might partner together to start offering fruit in farmers markets some day. There is also high demand from restaurants. They will not sell well in supermarkets because the fruit will be much more expensive than the tasteless tomatoes, and someone needs to explain what they are, why they are different, and even offer samples. Eat these and you will never buy the garbage sold in supermarkets again.



In case you are wondering, I have seen heirloom tomatoes packaged in plastic at Villa supermarket—two pathetic tomatoes for about 330 baht (that's \$10+ if you are still using a calculator). A large, plump vine-ripened tomato can be sold for 100 to 150 baht wholesale or in a farmers' market. Depending on the size of the fruit, a healthy plant can produce from 500 to 2,500 baht worth of fruit, which is cheaper for a restaurant than paying Air France or Qantas. But beginners should start growing their own tomatoes simply for the joy of it. You will probably enjoy eating and sharing them so much that you won't have any to give away.

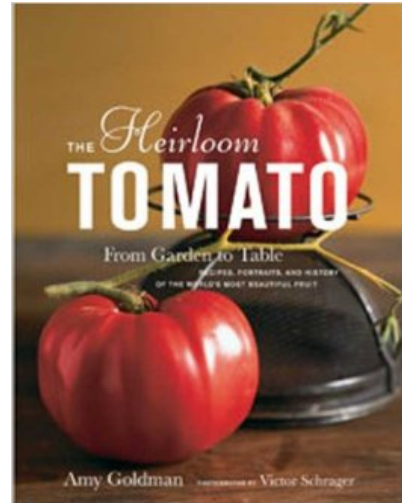
Suggested Reading

I own only one book about heirloom tomatoes. It is so beautiful that I keep it on my coffee table. You can buy it from Amazon if you have a friend who can hand-carry it to you. One of the larger chain bookstores in Thailand like Bookazine or Asia Books may be willing to order a copy for you. It is full of dazzling photographs, tomato-growing tips, and even some recipes. Cost is \$35 (about 1,200 baht).

Happy growing!



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