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## Tomato, Part I (Questions 1 - 41)

### **1. Q. When should I start my seed indoors to produce tomato transplants for my garden?**

A. Depending upon temperature and how the plants are grown, it takes from 6 to 8 weeks to produce a healthy, 6-inch tall transplant for setting out in your garden. The plants should be grown in a warm area and receive 6 to 8 hours of sunlight daily or tall, poor quality, leggy plants will result.

### **2. Q. How do you select good transplants at nurseries or garden centers?**

A. First, select the Extension recommended varieties of transplant whether it be tomatoes, peppers, eggplant or broccoli. Also, look for plants that appear healthy, dark green in color, and do not have any spots or holes in the leaves. The ideal tomato, pepper or eggplant transplant should be just about as wide as it is tall. Avoid tall, spindly plants.

### **3. Q. How often should my tomatoes be fertilized?**

A. It is necessary to fertilize the garden before planting tomatoes. Apply the fertilizer again when fruit first sets. From that point on, an additional fertilization (sidedress) every week to 10 days is recommended. Plants grown on sandy soils should be fertilized more frequently than those grown on heavy, clay soils. A general sidedress fertilizer recommendation is one to two tablespoons of a complete fertilizer scattered around the plant and worked into the soil. If using a fertilizer high in nitrogen such as ammonium nitrate or sulfate, reduce the rate to one tablespoon per plant.

### **4. Q. Should tomato plants be staked, caged or left unsupported?**

A. Tomatoes should be supported. Whether you cage or stake them is personal preference. Regardless of the method, plants with foliage and fruit supported off the ground will produce more than unsupported plants. Caging has several advantages. It involves less work than staking. Once the cage is placed over the plant there is no further manipulation of the plant - - no pruning, no tying. The fruit are simply harvested as they ripen. In many areas, staking and pruning of the plant to a single or multiple stem results in sunburn when the developing fruit is exposed to excessive sunlight. Other advantages of caging over staking include protection of fruit from bird damage by more vigorous foliage cover and less fruit rot. Caged tomato vines produce more fruit of a smaller size, but staked and tied plants produce less fruit which mature earlier yet are larger.

**5. Q. My tomato plants look great. They are dark green, vigorous and healthy. However, flowers are not forming any fruit. What is the problem?**

A. Several conditions can cause tomatoes to not set fruit. Too much nitrogen fertilizer, nighttime temperatures over 70 degrees F., low temperatures below 50 degrees F., irregular watering, insects such as thrips or planting the wrong variety may result in poor fruit set. Any of these conditions can cause poor fruit set, but combinations can cause failures. If Extension recommended varieties are used, the main reason tomato plants do not set fruit is because they are not planted where they can receive 8-10 hours of direct sunlight daily. Any less direct sunlight will result in a spindly growing, nonproductive plant with healthy foliage.

**6. Q. Are there really low-acid tomato varieties?**

A. There are some varieties that are slightly less acidic than others, but this difference is so slight that there is no real difference in taste or in how the tomatoes should be processed. Some yellow-fruited types are slightly less acidic than the normal red varieties, but not enough to make any difference. Research conducted by the USDA indicates that all varieties available to the home gardener are safe for water bath processing as long as good quality fruit are used. Flavor differences which exist between varieties are not because of differences in acid content, but balances of the sugar to acid ratio.

**7. Q. Some tomato varieties are recommended because they are determinate and fast maturing. What does determinate mean and can you tell if a tomato is determinate by looking at it?**

A. Determinate means the plant is small. Determinate tomato varieties seldom are more than 5 to 6 feet tall. A determinate vine is distinguished by a repeating pattern of two leaves followed by a flower or fruiting cluster. An indeterminate vine has a repeating pattern of three or four leaves, then a cluster.

**8. Q. Can I save seeds from my tomatoes from next season's plantings, and if so how?**

A. You can save seed from tomatoes if the variety is not a hybrid. Hybrid tomatoes do not come true from seed. The plants and fruit from seed saved from your home garden may or may not resemble the parent. Chances are the fruit will be poorer quality and the vine characteristics will not be the same as the parent plant. However, for true breeding varieties, such as Homestead, it is easy to save seed. To save seed from tomatoes or any other home vegetable fruit crop, leave the fruit on the plant until it is mature, pull it, squeeze juice with seed into a glass, let this ferment for two days adding water if needed. Rinse the seeds two or three times to remove debris. Seeds will settle to the bottom. After rinsing the seeds, blot them and place them in the sun to dry. Store the seeds under cool, dry conditions.

## **9. Q. When caging tomatoes, how large should the cage be?**

A. The diameter of the cage should be at least 18 to 20 inches. Smaller cages often restrict plant growth and reduce yields. Height of the cage will vary but generally 2 feet is sufficient for the recommended varieties. However, if vining types such as Better Boy, Homestead or Terrific, are used a cage 5 feet in height is preferred. Regardless of variety, the 2 foot tall cage is sufficient for most fall garden tomatoes.

## **10. Q. How do you stake tomatoes?**

A. Staking involves pruning or suckering the plant to either one or two main stalks. Tomatoes grown without support develop a bush shape. However, if the plant is to be trellised or staked, it must be pruned to a single or double stalk. The small suckers which develop between the axil of the leaf and the stem are removed to develop a vine structure rather than a bush. A wooden stake an inch in diameter and 6 feet long is driven into the ground beside the plant. Do not damage the root system when inserting the stake in the ground. The stalk of the plant is loosely attached to the stake as it grows. The plant can be attached to the stake with twist-ties, soft string, strips of cloth or panty hose. The plant is sufficiently supported if it is attached to the stake at 12 to 14 inch intervals. Continued suckering to prevent the plant from developing more than one or two central stems. If a double-stalk plant is desired leave the sucker produced above the first flower cluster since it will be the most vigorous.

## **11. Q. What causes a tomato to crack? Is there anything I can do to prevent it?**

A. Cracking is a physiological disorder caused by soil moisture fluctuations. When the tomato reaches the mature green stage and the water supply to the plant is reduced or cut off, the tomato will begin to ripen. At this time a cellophane-like wrapper around the outer surface of the tomato becomes thicker and more rigid to protect the tomato during and after harvest. If the water supply is restored after ripening begins, the plant will resume translocation of nutrients and moisture into the fruit. This will cause the fruit to enlarge; which in turn splits the wrapper around the fruit and results in cracking. The single best control for cracking is a constant and regular water supply. Apply a layer of organic mulch to the base of the plant. This serves as a buffer and prevents soil moisture fluctuation. Water plants thoroughly every week. This is especially important when the fruits are maturing. Some varieties are resistant to cracking, but their skin is tougher.

## **12. Q. What could cause the leaves of my tomatoes to turn brown along the edges?**

A. Leaf-burn or scorch generally indicates root injury, quite often caused by heavy amounts of fertilizer applied too near the roots. This injury often results in browning and die back of the ends and margins of the leaves. Other possible causes are root injury caused by nematodes, insects or physical injury by cultivation. Also overwatering or underwatering along with diseases might cause leaf-tip burn.

## **13. Q. About the time my tomatoes ripen and turn red, I lose at least half my crop to bird damage. What can prevent this?**

A. Bird damage is common in all areas. One control method which works quite well is to take old nylon stockings and cut them into pieces 10 to 12 inches long. Tie a knot in one end of the stocking and slip the open end over the entire cluster of tomatoes. Secure the end above the tomato cluster with a rubber band or twist-tie. Birds will not be able to peck through the nylon. Slip the stocking off the cluster and harvest the

ripe fruit and replace it to protect later-ripening fruit. Also, birds damage fully mature fruit more readily than breaker or pink fruit. Harvest in breaker or green-wrap stage. Gardeners have tried many ways to reduce bird damage. Scarecrows, aluminum strips, tin foil plates and noisemakers will work until the local birds become accustomed to seeing or hearing them. Fabric covering materials such as Grow-Web and Reemay can also be used as a barrier mechanism.

## **14. Q. What causes the black spots on the bottom of my tomatoes?**

A. Blossom end rot, caused by improper (fluctuating from too dry to too moist) moisture. Maintain uniform soil moisture as the fruit nears maturity. Remove affected fruit.

## **15. Q. What causes tomato leaves to curl?**

A. The exact cause of tomato leaf roll is not fully known. Tomato leaf roll appears about the time of fruit setting. The leaflets of the older leaves on the lower half of the tomato plant roll upward. This gives the leaflets a cupped appearance with sometimes even the margins touching or overlapping. The overall growth of the plant does not seem to be greatly affected and yields are normal. This condition appears to be most common on staked and pruned plants. It occurs when excessive rainfall or overwatering keeps the soil too wet for too long. It is also related to intensive sunlight which causes carbohydrates to accumulate in the leaves. Some varieties of tomatoes are characteristically curled.

## **16. Q. What causes some of my early tomato fruit from the spring garden to be oddly shaped and of poor quality?**

A. This condition is usually caused by low temperatures during bloom and pollination. Fruit that set when temperatures are 55 degrees F. or below often are odd-shaped and of poor quality. The blooms these tomatoes develop from often are abnormal because of temperature conditions and grow into abnormal, odd-shape fruit.

## **17. Q. Do products which are supposed to aid in setting tomatoes really work and if they do, how should they be used?**

A. These hormonal products are designed to substitute for natural pollination. These products work better when tomatoes are failing to set because of too cool temperatures. Tomatoes which set after use of these products will be puffy and have less seed.

## **18. Q. What is the plant advertised as a tree tomato?**

A. The tree tomato is a member of the Nightshade family. The regular tomato belongs to the same plant family but is a different species. The tree tomato has the scientific name *Cyphomandra betacea*. Like the true tomato, it is a native of Peru. It is grown in market gardens there and in several subtropical countries including Brazil and New Zealand. The tree tomato is woody, grows from 8 to 10 feet tall, bears fruit 2 years after seeding and may continue to bear for 5 to 6 years. They are not winter hardy except in southern areas and would need to be taken inside over winter. Fruits of the tree tomato are oval, about 2 inches long and change from greenish purple to reddish purple when fully ripe. The fruits are low in acid and the flavor is moderately agreeable. Some varieties of the tree tomato produce bright, red fruits. The fruits can be used in stew or preserves after the tough skin and hard seeds are removed.

## **19. Q. Should you allow tomatoes to become fully ripe and red on the vine before harvesting?**

A. Generally, yields will be increased by harvesting the fruit at first blush or pink instead of leaving them on the plant to ripen fully. A tomato picked at first sign of color and ripened at room temperature will be just as tasty as one left to fully mature on the vine. Picking tomatoes before they turn red reduces damage from birds.

## **20. Q. If tomatoes are picked green or before they are fully mature, how should they be handled to insure proper ripening and full flavor?**

A. Never refrigerate tomatoes picked immature. Place them in a single layer at room temperature and allowed them to develop full color. When they are fully ripe, place them in the refrigerator several hours before eating. Those handled in this manner will be of high quality and full flavor.

## **21. Q. What is a husk tomato?**

A. Husk tomato is also called Ground Cherry, Poha Berry or Strawberry Tomato. It is grown the same way as regular tomatoes and produces a fruit the size of a cherry tomato. The fruits are produced inside a paper-like husk which, when ripe, turns brown and the fruit drops from the plant. If left in the husk, the fruit will keep for several weeks. Like tomatoes, they are sensitive to cold weather and should be set out from plants after all danger of frost in the spring. Space the plants 1 foot apart in rows at least 3 feet apart. When ripe the small fruit can be used in pies, jams or may be dried in sugar and used like raisins.

## **22. Q. I have the best tomato crop I have ever had, but the large tomatoes are falling off the vines. Even the ones that stay on the vine are jarred off easily. What is the problem?**

A. Cool fall temperatures cause the abscission zone, the area where the tomato is attached to the plant to weaken, and the heavy fruit subsequently falls. Gather fallen tomatoes as soon as possible, wipe them clean and store them in a warm place to ripen. These aborted tomatoes will rot if left on the ground.

## **23. Q. I have large translucent areas on my tomato fruit. What's going on?**

A. This is an environmental problem. The translucent areas are sun scalds. Heat from direct intense sunlight destroys the color pigments of the tomato. This damage does not make the tomato inedible.

## **24. Q. Can I propagate tomatoes for the fall garden from spring- planted vines?**

A. If quality transplants of Extension recommended varieties cannot be found, use suckers or layering (cover with soil until roots appear) of existing vine. Do this several weeks before the recommend transplanting date for fall tomatoes, and use early-maturing tomato varieties.

## **25. Q. Can spring-planted tomatoes be cut back in late summer or early fall resulting in renewed growth and increased production until the first killing frost?**

A. This can be done in some areas, especially in the southern parts. However, the plants must be healthy and

free of insect problems. Trying to carry an unhealthy plant through the summer into the fall usually means disaster. If the plants are to be cut back, avoid removing too much of the foliage since hot weather can burn the plants to death. After pruning, apply additional fertilizer and water to renew growth and increase tomato production well into the fall.

## **26. Q. How do you tell when a green tomato harvested early to prevent freeze damage will ever turn red and ripen?**

A. This can simply be done with a sharp kitchen knife. Harvest a tomato typical of the majority of green tomatoes on your plants. Look at size but pay particular attention to fruit color. Slice through the center of the tomato. Closely examine the seed within the fruit. If the seeds are covered with a clear gel which cause them to move away from the knife, then that fruit will eventually turn red and ripen. If the seeds are cut by the knife then those fruit will never properly ripen. Compare the color and size of the tested fruit when harvesting tomatoes on your plants. Most similar fruit will eventually ripen and turn red.

## **27. Q. Is a tomato a fruit or a vegetable.**

A. The tomato is legally-declared a vegetable by the Supreme Court of the United States. A vegetable is a herbaceous (non-woody) plant or plant part which can be eaten without processing and is usually consumed with the main meal.

## **28. Q. The foliage on my tomatoes is infected by irregularly- shaped spots which cause it to turn yellow and drop off. This occurs in all seasons and is on the top as well as the bottom leaves.**

A. Several types of leaf spots will attack tomatoes. Septoria leaf spot is seen quite often. ~~It can be controlled with a combination chlorothalonil and benomyl (Benlate) spray program. Begin the spray program early in the life of the plant. Apply chlorothalonil every 7 to 10 days adding benomyl every second spray (14 to 20 days) if humidity is high or rain and dew cause wet foliage.~~

## **29. Q. The leaves on my tomato plants are distorted. Why?**

A. This is a mosaic virus. If the virus is severe, remove the plants to prevent spread to other plants. Many viruses are insect transmitted and are difficult to control even with insecticides.

## **30. Q. My tomato plants are stunted and have a pale yellow foliage. The root system has knots or swellings on the roots.**

A. These are root knot nematodes. Varieties such as Celebrity, Better Boy and Small Fry resist this problem. If other varieties are to be grown nematode populations must be reduced. Root knot is a species of nematode which causes galls or swellings on plant roots. It restricts the uptake of nutrients from the root system to the foliage, resulting in a yellow and stunted plant. Root knot lives in the soil and can survive on a number of weed and vegetable crops. It is best controlled by planting a solid stand (close enough for root systems to overlap) of marigolds three months before the first killing frost of fall and/or planting cereal rye (Elbon) for a winter cover crop. Cereal rye should be shred and tilled into the soil 30 days before planting a spring crop. Nematode resistance is indicated by the letter N after the tomato name. Example: Celebrity VFN.

**31. Q. My tomatoes were healthy during the spring and early summer, yet after a recent rain, they wilted and died very rapidly. I found a white fungal growth at the base of the plant.**

A. This is southern blight. It is a soilborne fungus and lives on organic material in the soil. Terrachlor used as a preplant treatment will reduce this problem. Also, the deep burial of undecomposed organic material in the soil will reduce the problem. Control foliage diseases on tomato plants because the fallen leaves around the base of the plant will feed the fungus, and it will build up in this area and cause damage later. Crop rotation will also reduce southern blight.

**32. Q. My tomato plants wilted rapidly. When I cut the stem open, I found a brown ring around the inside.**

A. This is Fusarium wilt. It is a soilborne fungus that attacks tomatoes and other crops. It is controlled only through the use of resistant varieties. Most commercial tomato varieties are resistant. Before you plant a variety, make sure it is resistant to Fusarium wilt. This resistance is denoted by the letter F after the name. Example: Celebrity VFN.

**33. Q. What do the letters "VFN" associated with particular tomato varieties indicate?**

A. VFN indicates the tomato variety is resistant to three types of diseases; Verticilium wilt, Fusarium wilt and nematodes. Many of the new hybrid varieties are VFN types. Disease resistant varieties preferred in areas of Texas where these problems are severe and cause great losses to home gardeners.

**34. Q. The lower foliage on my tomatoes is beginning to turn yellow and drop. The leaves have circular, dark brown to black spots.**

A. This is Alternaria leaf spot or early blight. It is a common problem on tomatoes and causes defoliation, usually during periods of high rainfall. Plant tomatoes on a raised bed to improve water drainage. They can be spaced enough so air can move, dry the foliage and prevent diseases. Follow a spray program using daconil beginning when the fruit is set and continuing at 1- to 2-week intervals during the growing season until harvest.

## Insects

**35. Q. My tomato fruit have small yellow specks on the surface. When the fruit are peeled, those yellow specks form a tough spot that must be cut off before eating the tomatoes. What's wrong?**

A. Your problem is not of a varietal origin. The yellow speckling is caused by sucking insects such as stinkbugs or leaf-footed bugs. Early control of sucking insects that feed on the fruit is helpful in alleviating the problem.

**36. Q. We planted tomatoes in our small garden. They are loaded and are the best tomatoes we have ever had; however, there are some small holes near the stem end of the tomato. When we cut the tomato open, there is a small worm inside. What is it and what can we do?**

A. You have been invaded by the tomato pinworm. They usually do not damage all fruit and can be

controlled only by a preventive insecticide spray every 7 to 10 days. When the damage is evident, it is too late to do anything about it.

### **37. Q. What causes my tomato leaves to turn yellowish and fall off?**

A. Many conditions may cause these symptoms including spider mites, diseases and nutrient deficiencies. Examine the underside of the leaves for small red to greenish mites. If mites are found, treat with Kelthane, malathion or sulfur dust. Make two to three applications at 5-day intervals for best results.

### **38. Q. On some of my ripe tomatoes I have discovered small holes with numerous ants in them. I was unaware that ants could do this to tomatoes. How can I control them?**

A. Ants aren't really your problem. They are just attracted to the moisture in the holes which were caused by other insects. A likely culprit is the tomato fruitworm, also known as the corn earworm. Bt (Bacillus thuringensis) is a nontoxic biological control which you can apply to the plants.

### **39. Q. My tomatoes wilted and died soon after they bloomed. Last fall I had the soil tested and followed the recommendations. I didn't notice any insects on the tomatoes, and none of the other plants growing in that area were affected. The plants were in full sun, though one limb from a black walnut tree which is about 20 feet from the garden reaches over that corner at about 30 feet above the ground. Could the slight shade from this branch cause such a severe problem?**

A. The branch is not the cause of your problem, but the tree it is attached to probably is. Roots of black walnut and butternut trees release a substance called juglone which kills roots of sensitive plants. Tomatoes happen to be among the most sensitive, and should not be planted within at least 50 feet of these trees. Juglone is emitted from living and dead roots and can persist in the soil for over a year, so avoid areas where juglone producing trees have grown for two to three years after removing the trees.

### **40. Q. What is disease resistance?**

A. Disease resistance is the ability of a plant to withstand attack from disease causing organisms such as bacteria, fungi, or viruses. The extent of resistance can vary from being strongly resistant to infection to being only somewhat more tolerant of the disease than standard varieties. Resistance is not immunity. Improper culture of a resistant variety may negate that resistance.

A. Plant breeders have a tough job to breed disease resistance into crops because there are so many diseases and often several strains of a given disease. What is often done is to select the disease that causes the most problems and work on breeding resistance to that disease. Seed catalogs and packets indicate what, if any, disease resistance a variety has in descriptive text or with initials following the variety name.

Disease resistance in tomatoes indicated by initials include:

- V - Verticillium wilt
- F - Fusarium wilt (F1, race 1; F2, race 2)
- N - nematode
- T - tobacco mosaic virus
- A - Alternaria alternata (crown wilt disease)



L - Septoria leafspot

**41. Q. Enclosed are two tomatoes which came off of one vine. This plant also has some leaves on the lower part of the plant that don't look as good as the rest of the plant. All plants are the Bingo variety planted at the same time, same fertilizer, etc. Plants are about 5 feet tall. There are 10 plants in this group. This is the only plant affected now. Will these tomatoes be good to eat and can you tell us what caused this? Any help will be appreciated.**

A. Along with those black, scabby tomatoes you sent me, you have done an excellent job describing the plant nemesis called Tomato Spotted Wilt Virus (TSWV). In 1986 TSWV annihilated 60-70 percent of tomato and pepper transplants in the area as well as five million dollars worth of peanuts in Frio County alone. Luckily, the intensity of infections has diminished to a normal 10-15 percent so your one infected plant in ten is about normal. Infected tomato plants have many small, dark, circular spots on younger leaves. Leaves may have a bronzed appearance and later turn dark brown and withered. Flushes of new growth are yellowish and distorted. Fruit has many spots about one-half inch in diameter with concentric, circular markings. On ripe fruit these markings are alternate bands of red and yellow. Pepper fruits may have dead spots as well. Insects named thrips are the culprits that spreads the virus. Insects feed on a plant with virus and transmit it to another plant. Not all insects spread virus. The insects which have been known to cause problems include aphids, thrips, white flies and leaf-feeding beetles. Virus prevention is difficult - - 100 percent insect control is impossible as well as impractical. Even if you could grow a plant which was full of pesticide and would kill any insect immediately if it damaged the foliage, the virus is delivered the instant the plant tissue is penetrated. Insect sprays are not the answer; I recommend a physical barrier such as covering with Grow-Web netting during the first two months of growth. The larger a plant is before infection occurs, the more productive it will be. The soil is not contaminated so you can, and should, remove the infected plant and replant a cherry tomato or a Surefire in the very same hole. The fruit of infected plants can be eaten if you are man (or woman) enough to eat anything that ugly!

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