

Tomato Cracking: Is it Preventable?

Home gardeners often face the problem of tomato cracking, or hard cracks on the upper part of the fruit, usually spanning from or circling around the stem.

While the cracks do not necessarily ruin the tomato, they are unsightly, said Kansas State University horticulture expert Matt McKernan.

“Tomatoes have a root system that is very dense and fibrous, and is quite efficient in picking up water,” he said. “Unfortunately, the root system’s capacity to absorb water and soil nutrients does not always balance well with what the above ground portion of the plant needs for a healthy tomato. This can result in conditions such as blossom-end rot and fruit cracking.”

McKernan said tomatoes most often experience cracking during periods of dry weather that are suddenly followed by heavy rainfall or watering. This rapid influx of available water causes the fruit to expand rapidly and leads to the skin cracking.

How can cracking be prevented? McKernan suggests consistent watering and mulching. Scheduled watering will prevent a quick influx of water likely to cause cracking. Additionally, mulching will help moderate moisture levels in the soil.

Another strategy for reducing tomato cracking, he says, is to harvest fruit as soon as it begins to develop color.

“Cracking is most common in tomatoes that are nearly ripe, when internal pressure often increases while the skin strength decreases, becoming less elastic and more prone to splitting,” McKernan said. “Harvesting tomatoes early and allowing fruit to ripen indoors at room temperature can help prevent further expansion that would occur on the vine, reducing the likelihood of cracks developing before harvest.”

Providing some shade for the fruit, whether from plant leaves or with shade cloth, can also reduce cracking. Shade protects the fruit from heating up in the sun and reduces temperature fluctuations that can result in cracking.

Some gardeners may be already following these recommendations and doing everything right, and still end up with tomato cracking. Faculty in K-State’s Department of Horticulture evaluated different tomato varieties over several years to try and come up with the most crack-resistant tomato.

“The difference seems to be the pliability of the skin rather than thickness; the more pliable the skin, the more resistance to cracking,” McKernan said. “An older variety Jet Star, has been the most crack resistant of any we have tested, including the newer types.”

Unfortunately, McKernan noted, Jet Star is a variety that can put out rampant, uncontrolled growth. Of the newer, more attractive varieties, McKernan said the Mountain Spring, Mountain Pride, Mountain Fresh, Floralina, and Sun Leaper varieties had good resistance to cracking.

VIDEO OF THE WEEK:

Sometimes insecticides or fungicides are necessary to protect vegetable crops. Applying pesticides safely, however, is critical to ensuring produce is healthy and safe to eat. This week’s *video covers Pesticides: When Can I Harvest* and discusses some of the key words to look for and critical parts of the label to read when applying pesticides in the garden:

<https://www.youtube.com/watch?v=Qu0NrVL2sWY>

GARDEN CALENDAR:

- Fertilize vegetables to encourage plant development.
- Remove old raspberry and blackberry canes after harvest.
- Dig, divide, and replant crowded irises.
- Remove faded flowers from annuals to stimulate more flowers for late summer color, and from perennials to prevent reseeding.
- Fertilize roses for fall blossoms.
- Water turfgrass deeply and less often for deep roots and a healthy lawn.
- Let grass clippings fall to the ground in order to return nutrients to the soil and lawn.
- Mow zoysia lawns at a 1½ inch mowing height.
- Remove sucker growth from the base of trees and along branches.

Cupping, Curling, And Leaf Distortion In Tomato Leaves:

When you look at tomato plants during the growing season, it is common to see leaves that are curled, rolled, or otherwise oddly shaped. These symptoms can result from a wide variety of conditions, including environmental stress, herbicide damage, viral infections, and even insect activity. With such a wide range of potential problems, it is important to take time to correctly identify the cause of the issue. To do this, pay close attention to which leaves are rolling, where they are located in the plant, and how those leaves compare to other leaves in the plant.

Environmental Stress and Physiological Leaf Roll: There are many environmental factors that can put stress on tomatoes, including excess moisture, over fertilization with nitrogen, heat and drought stress, root damage from cultivation, transplant shock, and severe pruning. These scenarios can all lead to leaves naturally curling or rolling as a normal survival strategy for the plant.

Most often this physiological leaf roll is caused by extreme changes in weather patterns. In the spring and early summer, tomato plants grow vigorously in mild, spring weather. The shoot growth often exceeds the root development. When hotter, drier summer weather occurs, the plants cannot uptake the water necessary to support all the leaves, and the plant attempts to reduce water loss (from transpiration) by rolling up its leaves to minimize surface area of the leaf. Similarly, these symptoms can also occur after heavy rains, when saturated soils limit soil oxygen for the roots, causing root damage, and limiting water uptake. Hot, dry winds, and any sudden change in weather can also lead to physiological leaf roll.

With physiological leaf roll, the leaves will curl upwards along the edges (margins) of the leaflets and roll inward towards the midvein of the leaf. Often these symptoms are present in the older, lower leaves, but over time, all the leaves on the plant may be affected. It is important to note leaves will be fully formed, normal size, and a healthy green color. The leaves may become thickened, developing a leathery texture, especially if the environmental stress persists.

Physiological leaf roll is a temporary condition that typically goes away after a week or so. During that time, the plant has a chance to acclimate to new weather conditions, recover from injury, or the soil has a chance to dry out. In most cases, yields are not greatly affected by physiological leaf rolling or cupping.

Growers can select tomato varieties that are less susceptible to this disorder. Indeterminate tomato varieties (with vine like growth) tend to exhibit physiological leaf roll more often than determinate tomato varieties (with bush like growth).

Providing consistent soil moisture during spring and summer weather shifts can also limit leaf roll. Mulch around plants and avoid damaging roots by tilling or hoeing near plants. Be sure to supply adequate soil nutrients, and do not over-fertilize with nitrogen fertilizers.

Herbicide Injury Damage: Herbicide injury is often a frequent problem with tomato plants, as tomato plants are extremely sensitive to even small amounts of many herbicides. In addition, many common phenoxy herbicides used in the lawn and landscape have the potential to volatilize (disperse as a gas vapor) and drift long distances. As a result, tomatoes, grapes, and redbud trees are some of the first plants in the landscape to indicate herbicide drift injury.

With herbicide injury, the leaves appear curled, cupped, and distorted. With herbicide injury, however, leaves are often stunted, puckered, partially formed, strap-shaped, and with odd leaf vein patterns. Leaf veins can appear parallel rather than netted. Sometimes the leaves will appear to be almost all veins, with no leaf tissue in between. Leaf stems (petioles) often become bent and twisted, sometimes in a curly-Q fashion. Plant stems also may develop small, light-colored bumps lower in the plant.

With herbicide injury, the newest growth of the plant is more susceptible to damage than the older leaves. Look for damage to other sensitive crops in the area. Damage to the leaf veins and stems, as well as malformed leaves, will separate herbicide injury from physiological leaf roll.

If herbicide injury is suspected, it is important to try to determine the source of exposure. Herbicide injury can potentially occur from pesticides the homeowner applied, from the soil the plant is growing in (sometimes manures used as gardening soil can contain herbicide residue that causes injury), from mulch (such as grass clippings collected from a herbicide-treated lawn) or drift from properties miles away. It is important to think about where potential herbicide exposure may have occurred, but it may be nearly impossible to pinpoint exactly. If plants had normal growth during the season, and then experienced injury later in the season (especially to new growth), herbicide drift is likely the cause of the issue. Multiple plants will likely experience drift symptoms at the same time.

With herbicide injury, it is a wait and see problem. Continue to water the plants to reduce other stress factors, and give the plant time to see how it responds. Often tomato plants can outgrow this type of injury if not repeatedly exposed to herbicides. Tomatoes showing only mild twisting will usually grow out of herbicide damage without seriously reducing yield or fruit quality. More severely injured plants may need replaced.

Other Causes Of Leaf Distortions: Viruses can sometimes also infect tomato plants, causing leaf rolling in tomatoes. Tomato plants are susceptible to a wide range of viruses, and symptoms can vary. With viruses, other symptoms are also likely to occur, including stunting. Leaves are likely to turn colors other than their normal green color, including mottled-coloring patterns or pale green colors.

Viruses usually affect only one or two plants and are often host specific (not likely to cause damage to redbuds, grapes, or other genera of plants). Viruses also rarely cause the curly-Q twisting of the new growth like herbicide injury would. There is no treatment for virus-infected plants. Removal and destruction of plants is recommended.

Insect and mite feeding can also distort leaf growth. As they feed, some insects and mites may inject toxins into the leaf with their saliva that can twist and distort the leaves. This is less common than physiological leaf roll and herbicide injury. Look for other signs of insect activity on the plant to identify insect issues.

In Conclusion: With many plant issues, it is possible to experience more than one problem at the same time on a plant. Both physiological leaf roll and herbicide injury can occur on the same plant, and hopefully the information above will help you to differentiate the issues.

Host Plants For Supporting Butterfly Caterpillars:

For gardeners and nature enthusiasts, seeing butterflies visit the garden is often a delight. While many people plant numerous blooming flowers to attract adult butterflies, providing host plants for larval caterpillars is often overlooked. These host plants are critical to butterfly survival, however, as many caterpillars have specific plant types they feed on for growth and development. Below is a list of some of the common butterfly species found in Kansas, and the host plants to consider planting in your garden to support them.

- Monarch Butterfly: Milkweeds (*Asclepias* spp.), including common, swamp, butterfly, and tropical milkweeds.
- Painted Lady Butterfly: Thistles, mallow, hollyhock, and sunflower family plants.
- Black Swallowtail Butterfly: Parsley, dill, fennel, rue, carrot, Queen Anne's lace, and golden alexanders.
- Eastern Tiger Swallowtail Butterfly: Black cherry (*Prunus* spp.), tulip tree, ash, sweetbay magnolia, and apple. Cottonwood and willow also support the Western Tiger Swallowtail Butterfly.
- Zebra Swallowtail Butterfly: Pawpaw
- Cabbage White Butterfly: Cabbage, broccoli, kale, mustard, other Brassicaceae crops and weeds.
- Common Buckeye Butterfly: Plantain (*Plantago* spp.), verbenas, Ruellia, and snapdragon relatives.
- Gorgone Checkerspot Butterfly: echinacea, rudbeckia, and sunflower family plants.
- Viceroy Butterfly: willow, cottonwood, and poplar trees.
- Variegated Fritillary Butterfly: passion vine, violets, and pansies.

As you plant caterpillar host plants in your garden, keep in mind the purpose of these plants will be to be eaten by caterpillars. This often leaves the plants damaged and unsightly looking. Consider planting caterpillar host plants in an area of the garden where damaged plants can be tolerated, and caterpillars can flourish.

For more information on supporting butterflies and caterpillars in Kansas, visit the *Creating Butterfly Habitat fact sheet* from the Johnson County Extension Master Gardeners: <https://www.johnson.k-state.edu/programs/lawn-garden/healthy-yards-and-native-gardens/native-gardens/docs/gardening-wildlife-docs/Creating%20a%20Butterfly%20Habitat.pdf>

For help identifying the butterflies visiting your garden, and for even more host plant suggestions, visit the *Pocket Guide To Common Kansas Butterflies*, created by the Great Plains Nature Center out of Wichita, Kansas: <https://gpnc.org/wp-content/uploads/sites/32/2017/12/BFlyPocketGuide.pdf>

Tips For Increasing Drought Tolerance Of Your Lawn:

Hot, dry Kansas summers can stress even well-maintained lawns. Fortunately, many simple, everyday practices can help turfgrass survive drought conditions while also reducing water use. While it is best to proactively build up drought resilience early in the growing season, it is never too late to update our lawncare practices. Make informed, intentional choices now by following the steps below:

1. Raise Mowing Heights: Increase the lawn's mowing height to improve the drought tolerance of your turfgrass. Low mowing heights stress turf, and require more water use to promote regrowth.
2. Water Only When Needed: Water when the lawn needs it, not based on a set schedule. Look for indicators of drought stress such as bluish-green color and footprints that linger after walking across the lawn before irrigating.
3. Water Deeply When Irrigating: Water deeply to encourage deeper root growth and drought resistance. Soak the ground 6-12 inches deep with each watering.
4. Apply Water Slowly And In The Morning: Minimize water loss by irrigating early in the morning to prevent water loss from heat and wind. Prevent runoff by applying water slowly, at a rate that matches the soil's infiltration capacity. Cycle and soak during waterings to allow water to be absorbed in between shortened watering cycles.
5. Avoid Shallow, Frequent Irrigation: Lawns that are watered often, and with small amounts of water are less likely to survive periods of drought than lawns watered infrequently, and for longer periods of time at each watering.
6. Control Weeds: Weeds will compete with turfgrass for water. Control weeds to limit the amount of water lost to weeds, especially when water is limited.
7. Avoid Excessive Fertilizer Use: Reduce fertilizer use, as the more fertilizer applied, the more water is required to sustain the excess growth caused by fertilization.
8. Allow Turfgrass Dormancy: To survive drought, cool season turfgrasses naturally go dormant. While the lawn may turn temporarily brown, green growth will return once temperatures cool and rainfall return. Dormant lawns can go 2-3 weeks or more without water, and survive up to 8 weeks without substantial irrigation (with approximately only ¼ inch of water every couple of weeks from irrigation or rainfall).
9. Inspect Irrigation Systems For Leaks: Check irrigation systems weekly during the growing season for leaks, overspray, or wasted water. Repair issues as they arise so that a uniform pattern of water can be applied, minimizing irrigation run times and the amount of water used.
10. Invest In Irrigation Technology: Many new technologies can improve watering efficiency. Invest in rain sensors, soil moisture sensors, smart irrigation controllers, and irrigation system components that reduce pressure and increase water droplet size.

Watering Established Trees During Kansas Summers:

Mature shade trees are often the most valuable asset in the Kansas landscape, but they are often overlooked when hot, dry summer weather arrives. Even established trees can benefit from supplemental irrigation during the summer.

This is the case not only during drought, but also with the weather conditions much of Kansas is experiencing right now. When Kansas weather shifts from a wet spring and early

summer to an extended period of hot, dry weather, mature trees and shrubs often need additional water to successfully make the transition and avoid drought stress. Mature trees growing in developed landscapes are especially in need of supplemental watering, as their soils have been disturbed and growing conditions are less favorable than those found in native woodlands.

While newly planted trees (those planted within the past three years), benefit from supplemental waterings every seven to ten days during the growing season, more mature trees need water less frequently. As trees and shrubs mature, the amount of time between waterings can also increase.

For trees and shrubs that have been growing in the landscape for three to five years, regular deep watering is still important, but the amount of time in between waterings can be extended. Most trees at this age will be able to tolerate approximately two to three weeks between waterings, depending on soil moisture and weather conditions.

For trees that have been in place for more than five years, the goal is to maintain vigor by soaking the soil to a minimum depth of 12 inches every three to four weeks when significant rainfall has not occurred. Using a rain gauge is an effective way to monitor natural precipitation and determine irrigation needs. Soil probes or a metal rod can also be used to evaluate soil moisture.

When watering mature trees, remember that water absorbing feeder roots extend well beyond the drip line of the tree (the area covered by the branch canopy of the tree, from the trunk to the outer edge of the widest branches). In fact, most tree roots are in the top 6 to 24 inches of the soil and occupy an area two to four times the diameter of the tree canopy.

Avoid watering mature trees only at the base of the trunk since the roots responsible for water uptake are located farther out from the stem. Focus on watering the entire area beneath the tree's dripline and at least several feet beyond. Since most feeder roots occupy the upper 12 inches of soil, make sure to thoroughly soak the soil 12 inches deep to deliver water to these important roots.

The most effective watering methods will allow water to penetrate deeply into the soil where roots can access it. Efficient watering methods include porous soaker hoses or a slow, pencil-thin stream from a garden hose moved periodically around the root zone. These surface applications will generally be more effective than devices that inject water deep into the soil in only one or two locations.

To further help reduce drought stress and conserve soil moisture, maintain a broad mulch area around trees. This helps to reduce evaporation of soil moisture, eliminate competition from turfgrass, and improve growing conditions for the tree. Just be sure to never apply mulch directly against the trunk of the tree, or over the root flare of the tree.

Visit our *Watering Established Trees And Shrubs* publication for more information about watering: https://bookstore.ksre.ksu.edu/pubs/watering-established-trees-and-shrubs_MF2801.pdf

Understanding Pesticide Labels - What Is Required Versus What Is Recommended:

Pesticides can often be misused when the label contains vague, unclear, or contradictory labeling text that makes it difficult for users to determine what is required. Users must be able to distinguish between mandatory and advisory statements to ensure proper use and legal compliance.

Mandatory statements are legally enforceable instructions, which are required to prevent harm to people, property or the environment. These statements use words such as “must”, “do not”, and “avoid” and are found in the directions for use, and precautionary sections of the label. These statements address how the product must legally be used or handled.

Advisory statements provide guidance or recommended practices to improve safety or effectiveness but are not legally enforceable. These statements typically use wording such as “should”, “it is recommended”, or “may”. These phrases often contain information on product characteristics, best management practices, or tips to reduce risk and should be followed whenever possible.

As a product user, it is important to make sure you have a clear understanding of the difference between these statements and are able to identify examples on labels you are using.

To further understand this topic, we can look at an example label. Visit the Horticulture newsletter online to look at the Dimension 0.25G label and identify some examples from the label.

Remember advisory statements are best management practices that should be followed for application safety, but these statements are not legal requirements. To be enforceable, label requirements must state in positive, direct terms such as “must”, “do”, or “do not”. *Matthew McKernan, Consumer Horticulture Extension Associate; Frannie Miller, Pesticide Safety and Integrated Pest Management (IPM) Program Coordinator.*

For questions or additional information, contact: hortsupport@ksu.edu

Mention of trade names, brand names or commercial products in this newsletter is solely for identification purposes and does not imply recommendation or endorsement by Kansas State University, nor is criticism implied of similar products not mentioned. Although every attempt is made to produce information that is complete, timely, and accurate, the pesticide user bears responsibility of consulting the pesticide label and adhering to those directions.

The heat is on: Staying safe in the hot Kansas summer

While longer days and warm sunshine can be enjoyable, the heat and humidity of a Kansas summer can also pose serious health risks — especially for older adults. Kansas State University associate professor and extension specialist in adult development and aging Erin Martinez says there are important precautions to stay safe during the hottest months.

“As we get older, sometimes our bodies don’t regulate heat as well as they once did — including how much sweat we’re able to produce and how our heart rate responds. Older adults are also more likely to take medications that can impact how they manage the summer heat,” Martinez said.

Martinez encourages older adults to speak with their doctor or pharmacist about how their medication may affect their ability to handle heat.

“Some medications can increase your heart rate or make you less likely to sweat,” she said. “That impacts your body’s ability to regulate temperature.”

If outdoor activity is necessary, Martinez recommends avoiding it during the hottest part of the day — typically between 10 a.m. and 4 p.m.

“If you must go outside during the hottest part of the day, try to keep it limited to short periods of time,” she said.

To manage daily tasks like gardening or errands, Martinez suggests planning them for earlier in the morning or later in the evening when temperatures are cooler.

Although summer weather might inspire people to wear tank tops and shorts, Martinez recommends more protective clothing.

“Wearing a very thin, lightweight, loose long-sleeve shirt is really your best bet because it protects you from the sun,” she said.

Hydration is also key; it’s important to drink fluids regularly, not just when you feel thirsty.

“It’s really important with older adults that we encourage fluid intake and not wait until we’re totally dying of thirst to get a drink,” Martinez said. “Offering foods like watermelon or broth soups that have high water concentration are different choices that can help with hydration.”

Martinez also notes that staying indoors during peak heat can reduce social interaction, which is vital for overall well-being. She encourages older adults to find alternative ways to stay active and connected.

“Utilizing your community facilities — a recreation center, library or doing indoor activities with friends — helps keep you interacting and learning new things,” she said.

As temperatures rise, Martinez reminds everyone to remember to check on neighbors, stay cool and help one another beat the heat.

In the garden: Am I growing plants, or feeding grasshoppers?

If gardeners get this eerie feeling that they’re feeding grasshoppers right now, they’re likely not alone.

Kansas State University horticulture expert Matt McKernan said many grasshopper varieties make their home in gardens this time of year, preferring the luxurious accommodations – rife with leaves, flowers, stems and seeds – as they molt and mature.

Grasshoppers have huge appetites and sharp, chewing mouth parts to damage fruit, defoliate trees, or even devour entire plants. They are considered one of the most destructive garden pests.

“Full-sized adults are the most problematic because they have wings and can move long distances,” McKernan said. “They also have tougher skin, making insecticides less effective.”

Gardeners should act early if they detect grasshopper infestations.

“Nets and floating row covers can be effective protection for small areas, though grasshoppers have been known to chew through netting,” McKernan said. “Gardeners who want to avoid insecticide treatments have to decide the amount of damage to garden plants that they can tolerate. In suburban areas, it is important for gardeners to work together to control grasshoppers and limit the destruction.”

McKernan said insecticides are usually effective when the spray comes into direct contact with the grasshopper. This will be most effective if applications are made just before or at sunrise, when grasshoppers are less active.

“Most insecticides have to be re-applied to eliminate new arrivals,” he said. “Target hatching areas and immature grasshoppers whenever possible, as they are limited in their range since they travel by foot. They are easiest to control at this stage.”