

Yavapai Gardens

Master Gardener Newsletter

June/July 2018



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Tomatoes, the King of Vegetables!

by Nora Graf



Tomatoes are the Kings of the garden. More home gardeners grow tomatoes over any other vegetable. They are pretty easy to grow but they have some built-in problems. Below are some of the issues we encounter with tomatoes.

Big plants, no fruit

Do you have beautiful plants, growing wildly and yet you have no fruit? So, what is going on? Are you fertilizing frequently? That could be the problem. Too much nitrogen will increase the growth of the vines at the expense of the fruit for 3 to 4 weeks after the fertilizer has been applied. Until the nitrogen runs out, the plant uses it to grow vines. Once the nitrogen is used you should start to see flowers and fruit set.

When planting use a high phosphorus but moderate nitrogen fertilizer and don't fertilize again until you see flowers and fruit set. It is ok to lightly fertilize monthly. The brand of fertilizer isn't important. It is the ratio of ingredients and the amount that make the difference. One of the best ways to address this issue is good soil preparation before you even plant. Digging in compost before planting will likely reduce the need for fertilizer during the rest of the gardening season.

Flowers, no fruit and blossom drop

So now you have beautiful plants and flowers but no fruit. Setting of fruit can be affected by a number of factors including temperature, wind, soil, disease, humidity, sunlight and pollinators. One of the biggest factors in Arizona is temperature. Daytime temperatures of 90 degrees cause fruit set to slow down and stops altogether at 94°F, or when nighttime temperatures are over 75°F. On the other end of the scale, temperatures under 55°F stop fruit set also. For us it's the hot temperatures that have the biggest impact. Hot weather causes the pollen grains to bind together which reduces pollination. Another factor is that many pollinators don't work in hotter temperatures. Even if fruit develops, high temperatures can cause "whitening". Whitening causes white, hard areas in the fruit you can see when the tomato is cut open.

There are a few imperfect things that you can do to improve fruit development. Tomatoes are mostly self-pollinators. Basically, the pollen falls on the stigma below it. One way to get the pollen to drop is vibration. In greenhouses with no wind, plants are mechanically



shaken. Just go out to your plants and give them a good shake before it gets too hot. Encourage bumblebees in your yard. The vibrations they create work well to get the pollen moving. Another method is to just give the flowers a flick with your fingers. A more high-tech solution is to

take your electric toothbrush out to the flowers and vibrate the flower clusters for a few seconds.

There are hormone preparations available you can spray on the flowers to set fruit. You can find them in nurseries. I've had some luck with them but they aren't perfect. The sprays start the development of fruit, but don't actually fertilize the flower. The fruit will develop with no seeds or just very small ones.

Blossom drop is caused by environmental factors such as extreme temperatures (above 85°F in daytime, below 55°F during the night), poor watering practices, too much light, excessive wind, diseases, too much pruning and excessive fruit set. Humidity can also limit fruit set. Too high humidity (above 70%) is rarely a factor here but too low (below 40%) could be a problem. Fortunately, gardens create their own microclimate and good watering practices will help keep the humidity at an acceptable level.

Too high or low soil moisture is another correctible issue. Most vegetables like even watering. They don't like it too wet nor do they like it too dry. Adjust your watering practices as needed to keep the soil moist but avoid creating a swamp or letting the soil dry out. The worst is to alternate between those two disastrous circumstances.

Tomato plants need at least 6 hours of **full** sun a day. Too much or too little can cause blossom drop. It's more of a problem when growing tomatoes in greenhouses. (see "To Shade or Not" below) Just don't plant yours in the shade.

Diseases and insect infestations can also cause blossom drop. If you see a problem, you just need to address it whether it's a treatment or removal of the plant.

To stake or not

Some people like to stake, some not. Letting your tomatoes grow on the ground may invite more insect damage and rot problems while staked or caged plants may have more wind or sunburn damage. Yields are about the same.

To shade or not

I understand the compulsion to protect your plants from the ravages of an August sun and, considering what I said above about fruit set, you might think you should rush and do something. Tomatoes need 6 to 8 hours of full sun for the best production. With too little sun they will get leggy and flower-less. Too much sun and the tomatoes may sunburn. The best shade level is 20 to 40% shade. Most

of the shade cloth that is sold locally is rated at more than 40% but you can find more open versions online. Even with our heat, the whole plant doesn't have to be shaded.

Fruit can be ruined by sunburn. I have found that having a plant that is healthy and growing well creates enough leaf cover to protect the tomatoes from the sun. If you have a scraggly plant with poor leaf cover for the fruit, I'd say yes, try to come up with a creative way to shade the plant just during the hottest part of the day.

The dreaded tomato hornworm

There is a lot of gnashing of teeth about hornworms. I'm on the side of less control but each of us have different tolerances for the beast. Some years are worse the others so your tolerance may change from year to year. Just a reminder that caterpillars, like the hornworm turn into moths



and butterflies. In the case of the hornworm they become sphinx moths with about 10 species in Yavapai County. Sphinx moths are great pollinators and are very interesting in their own

right. Now after that brief defense of less control than more, hornworms are easily controlled. The simplest is just to pick them off the plant and kill them. Step on them, drown them and some cats I've been told will take care of the job for you. You can use the biological insecticide *Bacillus thuringiensis* (Bt) on them. It is readily available and please read the instructions on how to apply. It is non-toxic and is safe for humans, pets and other wildlife. Look for BT that specifically targets hornworms.

Curly Top Virus

This is very common in Yavapai County and can affect many different crops. It is a viral disease that is hard to manage. The plants contract the disease from an insect, the beet leafhopper. The leafhopper picks up the virus in early spring from weeds like mustard and Russian thistle. Leafhoppers feed by piercing the plant and in the process spread the virus. The infected plant leaves start to pucker and become stunted, curl and roll upward while the main petiole down the center of the leaf curls downward. Leaves turn yellow and leathery and the veins turn purple. The plant eventually dies. Once the plant starts showing symptoms, remove the plant and throw it away. There is no cure and no chemical that can be applied that will cure the disease. Leafhoppers are good fliers and difficult to keep out of the garden. While tomatoes are not the favorite food of leafhoppers they will feed on them. The best way to prevent the leafhopper



from feeding is to prevent access to the plants. Use row covers from early spring to mid-season. Make sure the cover is secured to the ground. Remove a plant that is infected. You can replant the same spot.

Cat facing, Cracking and Zippering

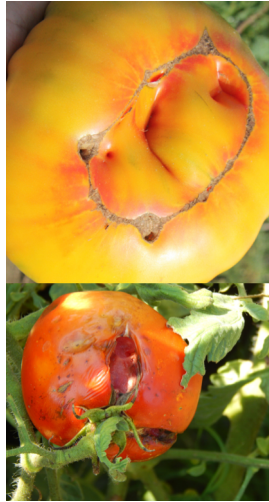
Catfacing is the malformation and scarring of fruit particularly on the blossom end. The fruit is puckered with swollen protuberances and can have cavities that go into the flesh. It is probably caused by extreme heat or cold weather (below 58°F at night) or drought (good watering practices will solve it), high nitrogen levels and herbicide spray. Some varieties are more susceptible to catfacing than others.

Cracking occurs when there is rapid change in soil moisture levels. The fruit expands faster than the skin can grow. They can be vertical cracks or circular cracks around the top. If the tomato is green when the cracking occurs the fruit will likely rot before it ripens. These tomatoes can be picked and allowed to ripen off the vine. Some varieties are more susceptible but make sure you are providing even watering. Cracking most often occurs during the monsoon season if we have heavy rains. If it rains hard in your garden, wait before you water again. Even moisture is what you are trying to achieve.

Zippering is brown tissue resembling a zipper, usually running from the stem end to the blossom end. It is caused by abnormalities during early flower development. It is not a common problem and if you have problems with it try a different variety, some varieties are better than others when it comes to zippering.

Blossom End Rot

It mostly affects tomatoes, peppers and watermelons. It shows as light tan to nearly black lesions on the fruit on the blossom end. The spot gets larger as the fruit matures. It can be caused by moisture stress, too much nitrogen, magnesium, potassium or sodium fertilization and high salt levels in soil or water. It is thought that there is not enough calcium available to developing fruit. Other factors may be extreme heat or cold, over-fertilization and acid soils. Tomatoes with blossom end rot usually don't ripen well. My experience has been that blossom end rot affects the first tomatoes of the season. As the weather and soil warms the problem disappears. Good watering and soil management practices should help prevent the problem. Additions of gypsum and calcium sprays are sometimes recommended but aren't really necessary in Arizona soils.



Good cultural practices and patience seem to be the best choice. Epsom salts is not a remedy to prevent blossom end rot.

Pruning

There seem to be endless emotional arguments about pruning tomatoes and, to be upfront about it, I'm in the "don't bother" pruning camp. I'm not going to tell you how to do it; there are hundreds of videos and articles about it online that do a better job of explaining than I could. Tomatoes don't require pruning. Pruning is designed to improve the amount of sun a plant gets and create healthy strong vines. It can improve a plant that has grown too large. I personally think it was developed in areas that gets a lot less sunshine than we do and for greenhouse production. Leaves are the generator of energy for the plant, you want lots of leaves for that. In Arizona lots of leaves also help protect the fruit from sunscald. One note: there are two types of tomatoes, determinate and indeterminate. Determinate only grow to a specific size and generally produce all the fruit at one time. They never should be pruned. Indeterminate have long vines that grow season long and produce tomatoes for the life of the plant. These are the ones that are pruned. So, prune or not, it's up to you. Seems just another time-consuming job to me.

Growing in containers

There are some particular challenges to growing in containers. Variety is important. You can grow patio tomatoes, determinate tomatoes and indeterminate tomatoes. Each need successively larger containers. Indeterminate tomatoes have extensive root systems and very, very long vines making them difficult to grow unless the container is large. Patio tomatoes have been developed to be small plants and do well in containers. Determinate are the middle child, bigger than patios, smaller than indeterminates. Match the container to the type of tomato. Use a good potting mix with compost—it needs to drain well. You don't want a soggy soil. Watering is critical. Find the sweet spot of not too much and not too little. Try not to let the soil cycle from very wet to very dry, even watering is the key. I recommend a drip system with a timer controlling the watering schedule. Even with that you need to keep an eye on them. Containers tend to accumulate salts in the soil and need to be flushed occasionally to remove it. Irrigation timers can go wrong. Just when you stop paying attention, they will stop working, need new batteries or the drippers will clog up. It will be something. Check periodically to make sure everything is working. If you are watering by hand, water thoroughly to get moisture throughout the pot and flush out salts. Don't let it dry out completely. Containers need to be fertilized more often but use light applications (approximately ½ the amount recommended) more often. Using a time-release fertilizer will also work.



So, if you planted tomatoes, don't let them drive you crazy. Have fun and here's hoping for a great tomato season!

Meet A Master Gardener—Kathy Sisley

By Linda Guy



“What? There are mountains in Arizona?” replied longtime Florida resident Kathy Sisley when in-laws suggested the Central Highlands of Arizona as a retirement destination. In 2010, she and her husband decided to make Prescott Lakes their home. Always a fan of homegrown tomatoes, Kathy wanted to know more about high altitude vegetable gardening, and our very different soil and arid climate. Even drip irrigation was new to her. Clearly the Master Gardener training was the answer and she completed the

program in 2011. There are now two (for crop rotation) large, protected raised beds for herbs and vegetables. A remote thermometer allows her to keep tabs on the temperature, especially when using frost protection.

Kathy’s single biggest gardening challenge has been wildlife. She may know horses after 18 years on mounted patrol (she is a retired deputy sheriff from Dade County). But the urban—wildland interface has presented a number of four-legged (and other) encounters at her unfenced $\frac{3}{4}$ -acre home. Deer have grazed the tops of bushes, netting was added to keep lesser goldfinches from her greens (they disdain her red varieties) and quail have crept under frost cloths to feast. She plucks tomato hornworms and uses crushed egg shells to top dress against snails. She is considering strawberries as a ground cover in a remote portion of the yard and may just leave the fruit to the birds and bunnies.

The real fun began after adjacent new home construction rerouted the pathway of the local javelina herd through her property, eventually requiring a four-

strand (three hot and one ground) electric enclosure around the vegetable beds, roughly 18” high, set to livestock voltage level. I was very careful stepping over this fence to admire her gardens! Aluminum foil tabs smeared with peanut butter (attached when system is deactivated of course) ensure that the critters get the message to keep out. An eco-friendly solar panel powers the barrier, but the javelina still indulged one year when Kathy forgot to test the back-up battery.

The wildlife-resistance of iris has not gone unremarked and she has a large, lovely bed of heirloom varieties. She is a member of the Prescott Area Iris Society and competes at the county fair and the Annual Kaleidoscope of Color at Mortimer’s Nursery. She placed first at last year’s juried competition, as well as garnering first and second place in the People’s Choice.

Kathy is a familiar face in our ranks with well over 1000 volunteer hours. Early on she was dubbed the “Lunch Lady”, managing meals for all involved in our annual Monsoon Madness Sale. She’s also affectionately referred to as the “Pot Lady” for maintaining our shed filled with pots, containers and nursery supplies. Kathy oversees the landscape committee for her neighborhood HOA and she volunteers weekly in the butterfly and vegetable gardens which help to feed the animals at Heritage Park Zoological Sanctuary.

Kathy believes a MG Demonstration Garden would be a terrific addition to our public education efforts, if a suitable space could be located. Her advice to new (well any) Master Gardeners is to take advantage of any farm, college agricultural and garden club tours and expos because there is always something new to learn. Her most recent trick came from a tour at Whipstone Farm

in Paulden, AZ, where a nearly 100% germination rate of newly planted carrot seeds results when covered by wet burlap for 7 days or so.

Kathy’s update as we go to press: “While sweeping the upper deck I opened the gate and found a pile of javelina calling cards on the top step. That’s two full flights and a landing! They either really like my barbecue or were really hungry. This was a first even for me.”



Some of my Favorite Landscaping Plants

by Laurie Cameron

Tough, drought tolerant, javelina-resistant are the characteristics that I have grown to appreciate in the challenging climate of Sedona and the Verde Valley. I specifically mention javelina resistance because this characteristic is rarely mentioned on the internet or in gardening books. It's my experience that if it is resistant to javalinas it is resistant to deer and rabbits.



Salvia

Salvia is the largest genus of plants in the mint family, Lamiaceae, with nearly 1000 species of shrubs, herbaceous perennials, and annuals. From common sage used in your Thanksgiving stuffing to large bush sages, this wonderful genus is

drought-tolerant, ignored by foraging javelina and attractive to bees, butterflies and humming birds.

Narrow Leaved Sage, or *Salvia lavandulifolia*, is sometimes also referred to as Spanish Narrow-Leaved Sage. Native to the Mediterranean region, this sage is a compact, aromatic, shrubby perennial with small, narrow, downy, whitish-grey leaves. *Salvia officinalis* (sage, also called garden sage, common sage, or culinary sage) is a perennial, evergreen subshrub, with woody stems, grayish leaves. Both sages produce elegant spikes of pale violet-blue flowers.

Although I haven't tried to propagate common sage, I have very successfully propagated narrow leaf sage from soft wood cuttings.

A large variety of cultivars of ornamental salvias fill my landscape. Deep Blue Arizona Sage



is perfect for that shady spot. It blooms all summer with numerous small, deep blue flowers. Hot lips salvia and meadow sage draw bees and butterflies in abundance. Dwarf meadow sages are perfect for the rock garden. Furman's Red Texas Sage thrives on the west side of the house where the summer heat is at its most intense. One of my all-time favorites is the Mexican Bush Sage, an evergreen subshrub that produces white or purple flowers clasped by soft purple calyces from late summer to frost. It grows 3 feet tall by 3 feet wide. Butterflies and hummingbirds love it. It dies back in winter and regrows when the weather warms up.

Euphorbia Rigida

Also known as the gopher plant, I first noticed it when I was



walking in the neighborhood. It was thriving under a mesquite on the side of the road. Clearly it wasn't irrigated. Its pretty blue-green foliage provides an appealing contrast to the typical narrow-leaved plants that thrive in an arid landscape. In the spring, it is topped with chartreuse bracts and yellow flowers. I planted one in an area of my yard that would never be irrigated. I watered it sporadically to help it get established. After this winter with so little precipitation, I was amazed to see that it survived, was thriving even. The common name for the genus is "spurge", which derives from the Middle English/Old French espurge ("to purge"), due to the use of the plant's sap as a purgative. Mine is planted where the javalina run free and never touch it.

Of course, with a little water, the plant is even more beautiful.

Irises

As we all know, irises are perennial plants, growing from creeping rhizomes (rhizomatous irises). Although there are about 200 different species scattered worldwide, we are most familiar with only a few. When I first started gardening in this area of the world, I planted a few yellow bearded irises along my split-rail fence, which is a favorite passageway for the javalinas. They passed right by them.



From those few irises, I have propagated some thirty or forty by lifting and dividing the rhizomes. I also found some beautiful purple bearded iris growing on the side of the road in a vacant lot in my

neighborhood. I dug a few up and planted them in my yard as well. All of these have thrived. They are drought resistant and seem to thrive on neglect.

I have since planted Siberian, Japanese and Louisiana Irises in my rain garden, which gets inundated during the rainy season and during the winter precipitation (when we get some!). After ordering the Louisianas, I discovered that they need acidic soil. Time will tell if they



will survive.

Velvet Mesquite

I love this tree because it is so well adapted to its environment. In the spring, when produces its bright green leaves, it serves as a signal to gardeners that it is time to plant tomatoes. In summer these green leafy plants provide cooling effects of evapotranspiration and in winter, they shed their leaves to let the sunshine in.

Best of all it is one of the few deciduous trees that doesn't ever need watering. The taproot sinks deep into the earth, far deeper than the height of the tree, taking advantage of water sources inaccessible to most plants. Roots extend to about 50 feet, but depths as much as 175 feet have been recorded.

For decades, this attractive native tree has been maligned, abused and misunderstood. Yet mesquite survives and thrives, even in the midst of persistent drought and massive human efforts to eradicate it.

The most pervasive myth about mesquite is that it uses exorbitant amounts of water and is responsible for the drying of aquifers, springs, creeks and rivers. Common sense, logic and science argue against this myth. The amount of leaf surface of mesquite is much lower than other broadleaf trees, meaning that it has much less leaf area from which to transpire water; this is a common characteristic of water-conserving plants. Furthermore, mesquite leaves develop a layer of wax by late spring, which further reduces the amount of water used. Contrary to popular belief, mesquite is actually an effective conservator of water.

(<http://archive.gosanangelo.com/news/steve-nelle-misunderstood-mesquite-ep-458151214-354944481.html/>)

What's in YOUR Honey? It may not be the nectar you expected.

Reprinted from the *Garden Professors*, [February 7, 2018](#)

Author [Linda Chalker-Scott](#)

www.gardenprofessors.com



This month's National Geographic has a [brief article](#) from an ongoing study of the DNA profiles of urban honey. While we can all observe honeybees visiting flowers in our own gardens, until recently we could only assume what nectar they were collecting for honey production. This tantalizing snippet

completely blew me away.

The study, undertaken by an entomologist who founded the [Urban Beekeeping Laboratory and Bee Sanctuary](#), is sampling urban hives from major cities, including Boston, Portland (OR), New York, San Francisco, Seattle, and Washington DC. For each of these cities, National Geographic reports the top three plants for honeybees based on relative DNA levels.

Here's what I found amazing about this research: The top sugar sources are from TREES. Not wildflowers. We don't see bees visiting trees as easily as we see them visiting flowers, so our perceptions are biased. Over 75% of the sugar used for urban honey is from trees

The trees that are most popular for bee visitation are not necessarily native to those regions. Seattle bees, for instance, prefer linden and cypress trees, neither of which are part of the native coniferous forest. Likewise, the despised eucalyptus trees of San Francisco are one of the top three sugar sources.

You'll notice that I didn't use the word "nectar" in describing what bees are collecting. That's because much of the sugar they are gleaning isn't coming from flowers. It's coming from sap-sucking insects like aphids that produce honeydew. Bees apparently collect honeydew as well as floral nectar.

Urban areas usually have higher plant diversity than rural areas, given the variety of woody and herbaceous plants that people use in their gardens and landscapes. The researchers speculate that this higher plant diversity may be one reason that urban hives are healthier and more productive than rural ones.

Many gardeners operate under the assumption that native plants are the best choice for gardens and landscapes. Though certain landscapes (like those undergoing ecological restoration) should only be planted with natives, there is no evidence-based reason that we shouldn't be using non-invasive, introduced species as part of our planting palette. In fact, [research has demonstrated](#) that tree species nativity plays only a minor role in urban landscape biodiversity: most animals learn to use new resources in their environment. Honeybees, considered to be "super-generalists" insects, are demonstrating that in spades.

Fiscal Year Ends June 30th

Please submit all your volunteer and continuing education hours for this fiscal year by July 5th so the books can be closed.



2018 Newsletter Deadline Schedule

The newsletter comes out every two months. Please note the deadlines.

Publish	Date	Deadline
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Feb-Mar	Feb 1	Articles Jan 5, announcements Jan 25
April-May	April 1	Articles March 5, announcements Mar 25
June-July	June 1	Articles May 5, announcements May 25
Aug-Sept	Aug 1	Articles July 5, announcements July 25
Oct-Nov	Oct 1	Articles Sept 5, announcements Sept 25
Dec-Jan	Dec 1	Articles Nov 5, announcements Nov 25

From the Editor: Send or email articles to the address below. Email is preferred. Please see schedule for deadlines.

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MG NEWSLETTER



Next Meetings

June 20: Prescott, Kanin Routson, Stoic Cider Heritage Apples
July 14: Monsoon Madness Plant Sale, Prescott
August 15: Camp Verde
September 19: Prescott, Patricia Gulley, Batty About Bats HCNH Volunteer
October 13: Recognition Picnic
October 20: Fall into Gardening, conference, Flagstaff
November 14: Tricia Michelson, MG, Beauty and Bounty: Indoor Growing Systems
Jan. 16, 2019: Sue Smith, MG, NPS, TBD-likely masters research on Bears Ears grasses

Camp Verde Travel Information: Road work continues on Hwy 260 so please be careful. It can be a confusing mess sometimes, especially after dark. They have nearly completed the roundabout at Cherry Road. While they are still doing some work, the roundabout is now open for use. It is where you will exit to get to meetings and the extension office.

The entire project should be completed sometime this fall.