

# Yavapai Gardens

Master Gardener Newsletter

August/September 2017



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## Gardening Science

*From Science News Magazine*



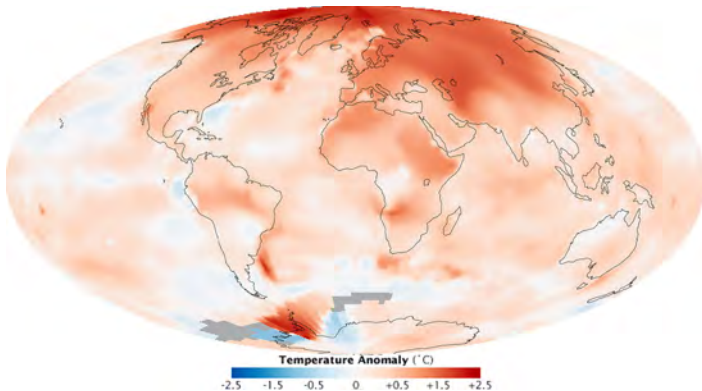
I have tried to include the main points of these articles but if you are interested in reading the original articles I've included the necessary information to find them. They can be found online at <https://www.sciencenews.org/>.

**“Tastier Tomatoes through Chemistry” by Susan Milius, February 18, 2017, page 12**

There is a lot of talk about the taste of tomatoes amongst gardeners.....which is the sweetest, which has the best tomato flavor, which is the tarest and which ones aren't worth bothering with. While it's hard to find agreement, (each of us has our favorites) one thing we can agree on is that store-bought tomatoes are pretty awful. Bred for their ability to survive the shipping process, their taste disappeared. It's not that breeders want that result but scientists have found that understanding tomato flavor compounds is complicated and how to get them back into the tomato is even more difficult, but they are trying.

About 30 compounds are important when it comes to tomato taste. Scientists at the University of Florida identified 13 of these compounds that have disappeared in the modern tomato. After analyzing the genetic makeup of 398 wild, heirloom and commercial varieties, 96 were picked to be taste-tested by humans. Turns out that smell may be more important than taste. Your nose is more sensitive to the aroma than your tongue is to the taste. Tomatoes have abundant volatile chemicals. Researchers determined that if they could breed between 4 and 5 of these chemicals back into tomatoes they would taste better. Sweetness is a whole other problem though. Sweetness depends on the leaves of the plants. As the fruit matures, sugar is transferred from the leaves to the fruit. Commercial growers maximize the number of fruit on each plant, removing leaves in some cases. If you have ever seen a commercial greenhouse of tomatoes one of the first things you

notice is the quantity of fruit on a plant. To get the sweetness back, the growers would have to balance the number of leaves to fruit, ending up with smaller and less fruit. So, looking for good tomatoes? Well that garden in the back yard will still have the best tasting fruit around. On a side note, there has been an ongoing discussion about keeping tomatoes in the refrigerator. Science says cold apparently turns genes on and off and weakens the flavor, so don't refrigerate.



**“Climate Change May Worsen Nutrition” by Susan Milius, Science News, April 1, 2017, pg. 14**

Many of you are aware of the disagreements about whether organic produce is more nutritious than non-organic but there may be something else to worry about soon. Turns out a warming climate and increasing CO2 levels may change the level of micronutrients in crops. Scientists have been looking at levels of selenium, zinc, iron and nitrogen concentrations in plants and have found out that differing levels of CO2 can change how much is available in the plants. All of these are important for humans and livestock. In places where people are struggling to feed themselves too much or too little of micronutrients could cause serious problems. Lack of nitrogen in grasses lowers the protein content available for livestock. Crop yields also decrease.

This research is fairly new and ongoing but, if you are interested, read the longer article in Science News.



After you read the following please don't run out and start spraying more pesticides around your house!

**“Diversity of indoor insects, spiders adds to life’s luxuries in high-income neighborhoods” by Susan Milius, Sept 3, 2016 issue, pg 15**

After collecting more than 10,000 arthropod samples from 50 houses in North Carolina scientists found that houses or city blocks with a higher than average income have a greater diversity\*\* of creatures. Lower income areas had less. The average house contained more than 100 arthropod species (not individuals). They also found there was a greater diversity of outdoor birds, lizards, bats and plants in higher income areas.

For those of you who have just freaked out, most were harmless and the homeowners never even knew they were there. The most common that showed up in 100% of the houses were Gall midge flies. In second place at 96% were dark-winged fungus gnats while cockroaches came in at 74%.

The reason behind the differences seems to be the number of plants in the surrounding area and larger houses had more habitat for a diversity of species.

For those that are still freaking out, just a reminder that you have been living successfully with them for years, probably not even knowing they were there. So chill, grab a margarita and watch the sunset.

\*\*they were looking for how many species, not the number of bugs in each house.



# Meet a Master Gardener – Dr. Mike Wagner

By Amanda Gagnon

I knew Dr. Mike Wagner had spent 30+ years as an accomplished, internationally-renowned, and now retired professor, author, and scientific researcher of forest health and entomology at NAU's School of Forestry. What I didn't know is that retirement hasn't slowed this professor from conducting meaningful science in his own backyard and beyond!

We strolled around his Santa Fe-style home (nestled in the red rocks of Sedona) late one May morning as we visited. Dr. Wagner has been a grower of plants his whole life. He grew up subsistence farming. Only flour, sugar, and coffee were purchased; everything else was grown or raised. Dr. Wagner says, "A lot of people like to romanticize that lifestyle but we didn't think it was very romantic. It was just life and work." As a young man, his first job was as a

student assistant to a plant breeder. During his professional career at NAU, he always had hobby gardens, so it was very natural to continue to garden when he retired to Sedona. He jokes that he joined the Yavapai County Master Gardener's Association (MGA) as a shortcut to learn how to successfully garden in the Verde Valley. He enjoys being a part of the MGA and says, "Master Gardeners are really fun people that like to get their hands dirty."

Dr. Wagner has three gardening passions: citrus, cactus, and milkweeds. However, the beautiful vegetable garden, abundant fruit trees and innovative gardening techniques employed around his lot prove his gardening interests peak in other areas, too. He is a self-proclaimed rebel when it comes to citrus. Citrus does not typically tolerate long-term freezing temperatures and, thus it is difficult to grow in the extreme temperatures of the Verde Valley. He experimented with Meyer lemons in pots, but determined to grow citrus "in-the-ground," Dr. Wagner explored the microclimates on his property. A microclimate is a distinct small-scale climate where the environmental conditions such as temperature, humidity, wind, etc. may subtly differ from the prevailing conditions. After thoughtful observations, he found a location on his property that is protected from cooler temperatures and wind, yet receives



optimal sunlight, and there he successfully grows kumquats! He says, "When you consider the microclimate in a microsite, you can grow all kinds of things."

The cacti gardens on the Wagner property are meticulous and phenomenal to say the least. There are 30 species of hedgehog cactus onsite, some of which have been successfully transplanted from elsewhere and others that Dr. Wagner has grown from seed. His mini cacti nursery is comprised of a frame box on a table covered with shade cloth, and lined with recycled juice bottles filled with water that act as a mini greenhouse. I was in awe of his backyard xeriscape garden, complete with beautifully vibrant, healthy blooming cactus, milkweeds, and other native flowers that he hasn't watered in three years; proving it is possible to have an attractive xeric native plants garden. Plenty of bees,

moths, and butterflies were fluttering by as he pointed out the golden rainbow hedgehog cactus, chocolate flower and spider milkweed.

The crown jewel of Dr. Wagner's passions is milkweeds as they are beneficial to pollinators, particularly butterflies. He is a co-leader of the self-organized, not-for-profit project: Milkweeds for Monarchs. Despite conservation efforts, monarch butterfly populations have declined in recent years. Monarch butterflies are dependent on milkweeds for food and predator defense. Milkweeds for Monarchs is a data collection project in which citizen scientist volunteers from the MGA in Coconino and Yavapai counties grow native milkweeds in their private gardens and document observations of the milkweeds and insects on a weekly basis during the growing season. The goal of the project is to determine the health of milkweeds and if they are attracting monarchs. Ultimately, Dr. Wagner desires to learn how to grow and sell milkweeds at a very cheap price (at cost) to get them into the hands of gardeners because, "It is the right thing to do for pollinators." Citizen scientist volunteers have already been selected for the 2017 growing season, but if you are interested in learning more about the Milkweeds for Monarchs project, visit the project website at: <https://www.azmilkweedsformonarchs.org/>

# Monsoon Madness 2017



Early morning logistics crew grapples with contrary canopy.



Sale Day: mass migration begins early in the morning.



*Show Time!*

Runner Bob Reynolds takes a break with cashiers Roberta Pelayo and Alicia Williams.



Sherry Morton assists John Baggentos in the holding area.

Peter Malmgren and Janet Stevens sort through the "treasures"



# Gardening Fact e3 Fancy

Updated from an article in the August 1995 of "HortNews", "Yavapai Gardens" precursor with information from the "Garden Professors" website, <http://gardenprofessors.com>

By Nora Graf

All of us have heard stories about how to garden successfully, but are they true or simply old tales handed down with no basis in science. Below are a few scientific explanations of the reason why something does or doesn't work and a feel for how some gardening practices have changed.

**Ever hear of "tree whacking.** Hitting the tree to increase the diameter or improve flowering. It's an idea I don't hear about much these days but myths linger, so best to mention it. Plants will sometimes flower under stress but hitting your tree is not going to improve its health. If it is not growing well or not flowering (when you think it should be, not necessarily when the tree is ready) look to your cultural practices. The tree is probably not doing well because it's in the wrong location, maybe you are watering it too much or not enough, maybe too much fertilizer or not enough. Don't hit it because you might damage the tree and really shorten its life.



Picture from Garden Professors Facebook page

**Watering on a sunny day can burn plant leaves.** If that was the case we would be in trouble when the monsoons hit. They come in the hottest, sunniest part of the year and raindrops generally don't stay around long enough to do any sort of damage. Plants are also adapted to deal with this. The reason not to water midday is that moisture will be lost more quickly to heat or wind. The best time to water is in the morning, not because of water drops on the leaves but because this gives moisture a chance to travel to the roots, before the hot sun dries it up.

**Remove lawn clippings or they'll make thatch.** Thatch is a layer of living and dead organic matter that occurs between the green matter and the soil surface. The problem with it, is that in some cases it can provide a good environment for pests and diseases and a poor environment for grass roots. Some grass species just naturally produce thatch. Thatch is often produced more by misuse of fertilizers and pesticides than by grass clippings. Grass clippings can act as a mulch and quickly break down. Since I originally wrote this, lawn mowers are now designed to chop up the cut grass and leave it on the surface. No more hauling all those clippings to the

trash.

**When planting trees and shrubs amend the soil heavily.** Studies have shown this is completely wrong. In fact, it creates a 'container in the ground' effect. The roots will not grow past the area of the amended soil. It is as an effective barrier as the wall of a container. Plants under these conditions are subject to toppling over and generally are not as healthy as plants whose roots have spread out into the native soil. If you cannot resist the urge to add something, use a mulch on the surface of the soil.

**Put a layer of gravel (Styrofoam peanuts or whatever) in the bottoms of pots to improve drainage.** It is the hole that provides the drainage. All that other stuff actually impedes it. Water does not move easily between different textures of materials. Use the same soil throughout the container. Just use a rock or broken pot shard to cover the hole slightly to keep the soil from washing out.

**When pruning, always cut tree branches flush to the trunk and use a pruning paint to protect it.** NO, no, no to both practices. Thank goodness Master Gardeners have had lots of opportunities to learn the correct pruning practices in Yavapai County. Cut at the branch collar not right at the trunk and just leave the cut open. Pruning sealers prevent the cut from healing properly inviting in insects and diseases.

**When planting a bare-root tree or any transplant, prune away enough branches to balance the top with roots lost when the tree was dug.** (Back in the day bare-root trees were very common. These days not so much but it applies generally to transplants.) Turns out that pruning can inhibit root growth. Leave the tree alone, it will limit its growth naturally. Trees understand the business of growing and pruning and you can actually remove some of the healthiest buds and roots. Only prune broken dead or damaged wood. Don't start any serious pruning until next year.

# Western Spotted and Western Striped Cucumber Beetle

*Diabrotica undecimpunctata howardi* & *Acalymma trivittatum*

by Nora Graf

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I haven't heard anything about these being a real problem in Yavapai County but I seem to have the spotted species at my house. Not really in my garden, they seem to prefer my front yard with mostly shrubs, trees and some perennial ornamentals.

These beetles are small, around ¼ inch. The spotted beetles are greenish-yellow with 11 black spots on their backs. The striped beetle is black with alternating black and yellow stripes. On both beetles the head, antennae and legs are black. Adults are good fliers and when I am working on my front porch they buzz around quite a bit, and apparently find me an attractive landing site, which is why I noticed them in the first place. They enjoy eating holes in plant leaves, flowers and fruits. The striped cucumber beetle feeds exclusively on cucurbit roots while the spotted beetle feeds on a wide variety of plants including corn, cucumber, eggplants, melons including the fruit, peas, potatoes, squash and fruit trees. The larvae eat the roots and stems of plants early in the season. They are major agricultural pests in some areas, especially in melons.

Unmated adults overwinter under weeds, leaves and debris. They leave their winter sites starting in March.

Females lay yellow-orange eggs anytime from April to early June. They lay their eggs at or near the base of cucurbit plants. Soil moisture is essential to their hatching which is one of the reasons they show up in irrigated fields. Once the eggs hatch, the larva starts feeding on plant roots after 6 – 9 days. The

larvae are worm-like and small with a white body and brown head. After 2-3 ½ weeks they complete the larval cycle and pupate in a small chamber in the soil. They remain there for 6 to 10 days and then emerge as adults. In warmer areas, there may be two to three generations per year.

Damage to plants occurs when they feed on the plant roots, seedlings, flowers and foliage. Their feeding on roots and tunneling in the stem can cause wilting and reduced yields. The smaller the plant the more damage they can do. In fruit trees, they cause scarring on fruit.

They also enhance the spread of fusarium wilt disease and are able to spread diseases like squash mosaic virus, cucumber mosaic virus, bean mosaic virus and maize chlorotic mottle virus. The bacterium that cause bacterial wilt is found in the gut of the beetles in winter and then is spread though their feces or mouthparts.

Control in fields can be difficult. There are pesticides that will kill them, but the pesticide has to actually be sprayed on the beetle and has no impact on larvae that is underground. In the garden, straw mulches help prevent their spread. Spiders eat them and straw mulches attract spiders.

Other mulches may work and using drip irrigations helps reduce their numbers. Clean up the garden debris. Removing their winter hiding sites will help control the beetles.





***Congratulations on completing 50 hours of volunteer service!***

Stephanie Goodloe  
Mentor—Diane McKelvey.

***Special note to Associate Master Gardeners!***

There may be some committee positions coming open for 2018 if you are interested in becoming more involved in the inner workings of the organization. Anyone can be a committee member; sign-up begins in August. Once you are certified, you would also be eligible for a committee chair or officer position. If you have such thoughts for the future, you might want to think about talking with a current officer or committee chairperson and perhaps "shadowing" them for a year to learn the ropes. We will talk about this more in the next few monthly meetings.

The MGA Recognition Picnic will be held on September 16<sup>th</sup> in Prescott. Watch for e-mail messages with details



**2017 Newsletter Deadline Schedule**

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

Publish	Date	Deadline
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*

August 16, Camp Verde, 6:30 pm

September 16, Prescott, MG Recognition Picnic,  
more information will be available at a later date.