**Events & Activities**

**MG Association Meeting**, Wednesday, June 19, 6:30pm  Camp Verde, Program: Bees & Beekeeping

Alta Vista Gardening Club, Prescott, fourth Tuesday of the month, 12:30pm. Call 928-458-9508 for information.

Prescott Area Gourd Society, third Tuesday of the month, 6:30 pm, at the Smoki Museum.

Prescott Orchid Society, 3rd Sunday of the month, 2pm at the Prescott Library, (928) 717-0623

Prescott Area Iris Society call 928-445-8132 for date and place information.

Mountain View Garden Club, Prescott Valley, Dewey area, 2nd Friday of month, 1:30pm, call 775-4993

Native Plant Society Meetings - Prescott. 2nd Thursday of the month, 6:30pm. Attending the talk qualifies as Continuing Education. Non-members are welcome. Highlands Center for Natural History, 1375 S. Walker Rd. (928-776-9550).

The Verde Thumbs Garden Club, Cottonwood 2nd Tuesday, 6:30 pm at The Seventh Day Adventist Church. (928) 634-7172

**The Bad News.....**

by Nora Graf

**Tomato-Tobacco Mosaic Virus**

One of the problems that could affect your tomatoes this year is the Tomato-Tobacco Mosaic Virus. Do not smoke around your tomatoes. If you smoke—Don’t touch your tomatoes without washing your hands. The most common source of the virus is actually debris contamination from hands or debris from a plant that has been infected. For smokers, the virus can come from cigars, cigarettes and pipe tobacco. The virus is passed through small wounds in the plants or by insects chewing on the plant. Once the virus gets in, it starts to multiply, eventually taking over the metabolic cell processes. This causes abnormal cell function leading to the symptoms you will see.

The symptoms are mottled (mosaic) areas with alternating green and yellowish patches. The dark green areas are elevated, giving the look of blisters. Other symptoms include discolored flowers, chlorosis, curling, dwarfing distortion and blistering of the leaves. The plant may be dwarfed. Cultural care, temperature and light can influence symptoms. The plant will usually survive but the virus lowers the health of the plant and the quality and quantity of the fruit.

The disease can overwinter in infected plants and on the surface of seeds and in tobacco products and can survive for many years. So one of the keys is to thoroughly clean out any infected plants and do not use seeds from infected plants.

Other plants can be infected by the virus. Some hosts include peppers, petunias, snapdragons, delphiniums and marigolds. The virus is also known to be carried in some plants at much lower levels and these include muskmelons, zucchini, squash, spinach, zinnias, nightshade (some species of nightshade are common weeds in Arizona).

Control can be easy—reduce handling the plants. If you are a smoker, thoroughly wash you hands and
tools frequently with soap and water. Bleach is not effective for virus decontamination. Any infected plants need to be removed immediately. When you purchase plants watch for any mottling, stunting or dwarfing. Do not purchase plants that appear unhealthy, thinking you can save them.

On a historical note, the Tobacco mosaic virus was the first virus discovered. Farmers had seen the effect of the virus starting in the 19th century; it wasn't until the 1930's that they figured out what it was.

The virus cannot be transmitted to humans and poses no risk to the health of the gardener!

**Curly Top Virus**

![Beet leafhopper](https://example.com/beet_leafhopper.jpg)

This virus is commonly seen in Yavapai County, unfortunately. A miniscule insect called the beet leafhopper spreads it. The leafhopper feeds on a large variety of plants and, once it becomes infected, the leafhopper spreads the virus for the rest of its life. And it can spread widely. Those leafhoppers are the insect equivalent of world travelers. It only takes a few minutes for the insect to acquire the virus but then as it moves from plant to plant it spreads its destruction. Infected plants will start to show the infection in 7 to 14 days. While tomatoes are not the preferred feeding source for leafhoppers, apparently they like to "sample", blithely spreading the virus as it tastes your plants.

Once the disease is identified it's best to remove the plants, as they will die anyway without setting fruit. It might mean not having any tomatoes but keeping the infected plants around just helps spread the virus.

There are some tomato varieties that are resistant to curly-top virus but most people seem to think they don't taste very good. Farmers have had some success in preventing infection by placing plants very closely together, using row covers and intercropping. But it doesn't always work.

Sometimes you just have to take the loss and move on to something else.

**Powdery Mildew**

With the monsoons on their way (keep your fingers crossed!), it's time to think about powdery mildew. Powdery mildew is a fungus and is one of the easiest plant problems to diagnose. If your plant has powdery white to gray spots you have powdery mildew (with some exceptions). In the case of tomatoes, peppers, artichokes and onions the plants will show yellow patches but little powdery growth. While the mildew can be found on any part of the plant, it can be most often found on the lower leaves. Infected leaves may gradually turn completely yellow, die and fall off. Loss of leaves may cause fruit to be sunburned. In some cases the leaves may distort or twist. Fruit are not usually directly affected, although pea pods may get brownish spots. Mildew can show up on a large number of plants including grapes, onions, fruit—like apples and pears—melons, squash, gourds, beans, peas, peppers, tomatoes, turnips, lilacs, strawberries and various trees. Different species of fungus infect different plants. With ornamental plants it just looks ugly, depending on how severe the problem is, but on fruits and vegetables it can affect the quality, flavor and yield.

Powdery mildew can be caused by a number of species of fungi. The spots of mildew get larger and denser over time as asexual spores are formed. Started from just one small spot, the mildew can spread all over the plant. It likes high humidity and moderate temperatures, hence it's showing up during the monsoon season and on leaves that are shaded from the sun. It does not need direct contact with water to grow. The fungal spores are spread by wind. It overwinters on plants and plant debris. It is one of the most common fungus diseases.

The good news is that it can be prevented and controlled to some degree. Preventing it is the first step. Try to find plants that are mildew resistant or mildew tolerant. Make sure the plants have good air circulation around them so that there is plenty of leaf exposure to the sun. Direct sunlight inhibits spore germination. For small areas of mildew, remove the leaf it is on. You can hot compost it to kill the spores but, if you don’t hot compost, discard in a plastic bag to prevent the mildew from spreading.

Good remedies to use to discourage the appearance of powdery mildew are: plant to make sure the leaves get as much sun as possible; use overhead irrigation, as free water inhibits spore germination and even kill spores; good air circulation. Open canopies on trees, prune grapes and fruit trees carefully so that air circulation and light is increased and the humidity is decreased.

Chemical remedies are available. Wettable sulfur and dusting sulfur can be used but READ THE LABEL; it can’t be used in temperatures above 90 degrees or with oil sprays.

Baking soda or bicarbonate of soda at a rate of one tablespoon per gallon of water can be used. It can burn leaves, so be careful with it. Apply when problem is spotted and repeat often.

Potassium bicarbonate is effective. READ THE LABEL for application rates.

Horticultural Oil works as an eradicant, especially...
Whiteflies

Have you ever seen a plant that looks like it’s covered in tiny snowflakes? Well it’s whiteflies. Touch the plants and a little snowstorm of flies erupts. They had an infestation in Yuma once that was so bad that I was driving on the interstate at the edge of town and I couldn’t figure out why it looked like it was snowing. Really!!! It was whiteflies. What a mess on the windshield. Outside of the amazement of snowstorms in summer, these are creatures you do not want. These flies first showed up in the United States on poinsettias in Florida in the mid 1890’s even though whiteflies were identified as far back as 1897. Once here they moved onto other crops in less than a year. It has been estimated they have caused over $100 million in damages to crops in Texas and California. In Yavapai County they sometimes show up on trees, tomatoes, squash and other vegetables. There are both vegetable whiteflies and tree whiteflies, which are separate species but both are related to aphids and psyllids. The white color comes from a mealy white wax that coats the body and wings.

Temperature is a big factor in determining whether you have whitefly problems. They are native to tropical, subtropical and some temperate climates. They are not able to survive in places with cold weather. Research into whiteflies indicates the pest came originally from India and is thought to have traveled on decorative plants to other regions. Whiteflies can carry numerous plant viruses including lettuce infectious yellows virus and tomato yellow leaf curl virus. It is considered an invasive species in all areas of the United States, Australia and some European countries.

The adult fly lays tiny, oblong eggs, usually on the undersides of the leaves. Females can lay from 50 to 400 eggs. The eggs hatch into nearly microscopic nymphs or crawlers. Females hatch from eggs that are fertilized; males hatch from unfertilized eggs. Once the nymphs find a location on the plant they like, they pierce the leaf and stay put until they become adults. Once they are mature they go into a dormant phase for a short time, then emerge as adults and the cycle starts again. In the summer it can be as short as a few weeks between generations. When flies feed off the host plant the area may develop chlorotic.
spots, wither and then die.

Along with the piercing action by the nymphs diminishing plant health, the flies excrete honeydew that encourages the growth of sooty mold and attracts ants. This process does not affect trees too seriously but they can decimate greenhouses and even kill plants in your garden. The problem seems to be worse in areas outside of Yavapai County.

Outside there are usually enough predators to keep whiteflies in check. This is good because the flies are very difficult to control using insecticides, as whiteflies are increasingly resistant to them. Minute pirate bugs, lacewings, lady beetles and big-eyed bugs are effective predators, while some wasp species lay eggs on the nymphs. Some options to try are insecticidal soaps or narrow range oil that will kill adults on contact and give temporary control. When using these products make sure that you hit the under surfaces of the plant. Only spraying the upper surfaces kills too many beneficials and you don’t get rid of the whiteflies. Yellow sticky cards, which are normally just used for monitoring can be used to control the flies in small isolated areas or in vegetable gardens. You can make your own by using a yellow painted ¼ inch piece of Masonite attached to a stake of some sort. Make an adhesive of one part petroleum jelly or mineral oil and one part household detergent. When the stickiness wears off, just wash it off with soap and water, dry it and apply more of the adhesive. You will need one trap for every two plants. The yellow sticky side should face toward the shade. Other control options include using aluminum foil mulch on the soil surface. You can also vacuum the flies up in cooler temperatures when the flies are lethargic. Other control options include using aluminum foil mulch on the soil surface. You can also vacuum the flies up in cooler temperatures when the flies are lethargic. You should place the vacuumed flies in a plastic bag and place in the freezer to actually kill the creatures. An overnight freeze is enough to do them in. Row covers can also be used to protect crops from the flies but they would need to be put on before the whiteflies show up, otherwise you would just be trapping the flies inside the row covers.

I haven’t heard of many whitefly problems in the county although I know they are here; I had them in my greenhouse at one time. Let’s just hope they stay at a low level.

**Aphids**

They’re here! This is the time of year you will find aphids in your garden. These tiny pests will literally suck the life out of many plants, especially flowering plants. Rose growers—watch out for these as they seem to have the same fondness for roses as we do.

Aphids, as if you hadn’t already seen them, are very small soft-bodied insects that come in a variety of sizes, shapes and colors. Some species feed on very specific types of plants while others are more generalists. They happen to be one of the most destructive insect pests on cultivated plants in temperate regions of the world. There are about 4400 species known but only about 250 of those are considered serious pests. They can carry viruses, bacteria and fungi that could infect your plant. The first problem you might notice is curled and stunted leaves and on closer inspection you might see a sticky substance on the leaves. This is a clear sign you have an aphid infestation.

The sticky substance is honeydew and in fact ants manage aphid “herds” for the honeydew they produce. They will even carry off aphids and move them to new locations. In extreme infestations the honeydew can actually drip from the plant, staining sidewalks. The honeydew also encourages the growth of sooty molds, another problem for your plant.

Aphids are miracles of reproduction. Females can reproduce without males. Unfertilized eggs hatch to produce more females. After several generations of this the females produce eggs that hatch into winged females, which fly to new food sources and give birth to more winged young which fly back to the original food plant where some females will become males. Males and females mate and the eggs that are laid over winter.

All this reproduction can be hard on your plants and there are pesticides that can kill aphids—but think again. There are a lot of things that feed on aphids, including lady beetles, ant lions and lacewings among them; the list is actually quite long. With so many predators in place you just may want to leave them alone. Sometimes, though, you feel you just have to do something and the easiest and cheapest is to just get your hose out and blast the plant with water. This probably won’t get all of them but it would be a real setback for them. You can also use soap sprays: one tablespoon of dishwashing soap (stick to something without lots of fragrances, antibacterial agents etc.) to one gallon of water. Spray a few leaves first to make sure the soap won’t harm the plant. When I am spraying smaller, more fragile plants I use my hand or you could use a board or something like that to support the branches and keep the water from beating down the plant. If you have ants tending the aphids you will need to control the ants. Use ant bait or pesticides just at the base of the plant; you don’t need to wide-spread pesticides to control ants.
Squash Bug—Anasa tristis

Or more formally known as the orange-tipped leaf-footed bug. Hhhhm....think I’ll just keep calling it a squash bug. You might already be familiar with this bug; it has a pretty distinctive shape. They are considered “true” bugs as they belong to the family Hemiptera that also includes stink-bugs, bed bugs and kissing bugs.

The bug averages about 5/6 inch long and is gray to black, with the edges of the abdomen having orange and brown stripes. The young nymphs have a red head and legs and green abdomen.

Squash bugs suck nutrients from the leaves with their piercing mouthparts. This disrupts the flow of water and nutrients, causing wilting. The leaves will start to show yellow specks, then wilting occurs and the leaf eventually turns brown. Large populations can cause serious damage to plants, including killing them, and are a common garden pest. On the fruit, squash bug damage can appear as stippling or light colored specks.

Plant debris is this bug’s friend so keeping your garden clean is important. The unmated adults over winter and shelter under plant debris and around buildings and under rocks. Nymphs typically die as soon as temperatures start to drop. When spring arrives the adults emerge and fly into fields with growing plants. They seem to prefer plants where the vines have started to “run”. They mate and the female lays eggs from spring until mid-summer. The eggs are laid on the undersurfaces of the leaves. Once they hatch it takes them 4 to 6 weeks to turn into adults. The nymphs hang together in groups at the base of the plant or under the leaves, although they can be found on other parts of the plant. There is usually just one generation per year.

Plants can tolerate low levels of the squash bug if they are healthy, so good cultural practices are important. The younger the plant, the more susceptible it is to damage. If they become a problem there are insecticides that will kill them. Make sure it is listed on the container. Neem works well on the nymphs. If you are not squeamish, you can hand pick the eggs and nymphs. The adults like to hide, so placing a board on the ground near your plants will attract them. In the morning it is easy to lift the board and gather them up.

Know your Arizona Plants:

Atriplex canescens

I have mixed feelings about this plant. On one hand it can be a little scrappy-looking; on the other it is a great wildlife plant. Think I love the name more than the plant. It just kind of rolls off my tongue dramatically. I know.....weird.....but I learned a lot of plant names in college and Atriplex canescens is one I never forgot. It is commonly known as four-wing saltbush—sometimes chamiso or chamiza. It grows over much of Arizona, including parts of Yavapai county. In fact it is one of the most widespread species of Atriplex in Arizona. It is found throughout the West.

The plant is a small to large multi-stemmed and branched semi-evergreen shrub and can spread to a height of five feet and width of eight feet. It is known for its deep roots and is sometimes used for erosion control. The form can vary wildly and will hybridize readily with other species in the Atriplex genus.

Leaves are a grayish green and narrow. The flowers are yellow but not conspicuous. Depending on its location, blooming occurs in July and August. It gets its name from the winged fruit. Four papery light green wing-like bracts surround the seeds.

Atriplex grows in sand dunes, chaparral, semi-desert grasslands, pinyon juniper woodlands and montane conifer forests at elevations from 2000 to 8000 feet. It is an early resident of recently disturbed areas.

The Zunis used parts of the plant to treat ant bites. They made an infusion of dried roots and blossoms and poultices of the blossom. Twigs of the plant are also sometimes attached to prayer plumes and sacrificed to the cottontail rabbit to ensure good hunting. The leaves and seeds are edible. Seeds are usually ground, while the leaves are eaten raw or cooked. Both wildlife and domestic animals browse the plant heavily. Deer, especially, use it in all seasons; elk use it in the winter and pronghorn feed on it year round. Small animals like game birds, other birds, rodents, rabbits and other small animals also feed on it.

Its hardiness has made it a plant that is used in reclamation. It is planted in mine spoils, roadsides and oil well reserve pits high in soluble salts and is well suited for revegetating saline sites.

Good news—bad news.....The plant is extremely drought tolerant and used for environmental rehab projects but its pollen is highly allergenic. So if you have allergies it might not be good for your yard.
Waves of laughter rippled through the Mackin Building the night of May 15 as the Master Gardener Class of 2013 celebrated their graduation. Led by MG Cathy Michner, groups of Mentors and Mentees tried to out-do each other by listing commonalities within their table that were different from other tables. “We all listen to NPR” was one winner, the most laughs came from another table claiming “we are all post-menopausal”. Shouts of “unfair advantage” were heard as this table consisted of all women MGs.

MGA President Bob Gessner then led the meeting through a series of introductions of the various MGA Committees. Angie Mazella reported 14 Mentees had shown interest in the Speakers Bureau. The Class of 2013 is off to a grand start.
MG Opportunities

Monsoon Madness

Sign-ups are nearly full. We do need MG volunteers (including those that have already signed up) who have specific gardening experience as SHOPKEEPERS.

Shopkeeper Description: Shopkeepers are responsible for overseeing one or more of the areas in the yard during setup and the sale. Plant Shopkeepers should be as familiar/experienced/knowledgeable as possible with the plants in their "shop" and should be comfortable with helping shoppers in making selections, looking up information when necessary, and referring shoppers to the MG booth.

First shift oversees the placement and content of plants being brought out from the barn; the shopkeeper(s) should identify any that seem to be in the wrong area. If there are questions, the I.D. notebook and/or Plant I.D. supervisor(s) should be consulted/ notified. In addition, since plants are quickly moved out, reorganizing/restocking/consolidating stock becomes important.

Second shift continues assisting shoppers and reorganizing/restocking/consolidating stock. In addition, just before the 1/2-price announcement, shopkeepers will count and record numbers of plants (by variety) unsold. They will also be responsible for helping with plants at the end of the sale.

Still need loans of wheelbarrows, hand truck, wagons for transporting customer purchases, contact Missy Sandeen.

For more information about storekeepers contact Kay Gaffney: kaygone@gmail.com or Steve McIntyre: zpsteve@yahoo.com .
To volunteer contact Missy Sandeen: rmsandeen@bullerinetworks.com

Searching the MG Newsletter on the Extension Website

Trying to find something in the back issues of Yavapai Gardens has always been difficult. There is a partial index available. Steve Moody has figured out a way to do it and it works better than the U of AZ’s CALS search engine.

Go to: http://www.arizona.edu/search/google

In the search window type in: “Yavapai Gardens” (including the quotes) and the topic you are looking for. For example:

“Yavapai Gardens” tomato blight

The search engine retrieves all the issues with tomato blight information.

FROM THE EDITOR: Please send or email articles and announcements to the address below. All articles must be in my hands by the 10th of the month. Short announcements (no more than 2 or 3 lines) will be accepted until the 25th.
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Next Meeting

The meeting site is the Superior Court Building off of Hwy 260 in Camp Verde.
2840 N. Commonwealth Dr.

June 19, 6:30pm
Speaker: Cliff Deane
Bees & Beekeeping