As expected for the summer months of June through September and sometimes October, the triple digit high temperatures have set in for the next foreseeable future. Are your plants ready?

June generally is the month of highest temperatures and lowest humidity. This combination is tough on landscape plants because they must have water to cool themselves and to move energy and nutrients from the roots to the leaves where they are used. The hotter and drier it is, the more water they need.

Without water, the long term prognosis for good plant health is pretty bleak. Since rainfall is almost always insufficient for the needs of most of our plants, irrigation is essential. Without water, a large percentage of our landscape plants will die. We have to irrigate if we want healthy garden and landscape plants.

I see it all over the county. Water wells, when they exist, are too narrow to nourish the roots out near the extremities of the plant canopy. Drip system emitters are placed next to the trunk instead of out near the drip line where most of the workhorse roots are found. Irrigations are too hit or miss and sprinkler heads are broken or off kilter. Each of these conditions can lead to sick looking plants. Some even die.

What are some of the signs of water stress? Trees and shrubs showing signs of leaf fall with bare spaces on the branches out near the tips often only leaving one or two leaves for some distance along the branch is a most common symptom. Limp and discolored eaves are others. Slow growth of leaves and stems, and leaves that are smaller than normal sometimes indicate a lack of water. All of these are cause for concern when it comes to plant health because they generally mean that the plants are struggling.

While it is true that Arizona native plants and their desert-adapted cousins can survive extended times of drought fairly well, there is always that breaking point beyond which a particular species will begin to suffer damage and eventual death. Again, there are no plants that can go indefinitely without water.

The implications for gardens and landscapes are pretty obvious to those with experience in dealing with plants. Accurate and timely irrigations are of supreme importance during hot, dry months in order to maintain the good health

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The implications for gardens and landscapes are pretty obvious to those with experience in dealing with plants. Accurate and timely irrigations are of supreme importance during hot, dry months in order to maintain the good health
of landscape trees and shrubs. Here are a few suggestions that you might want to consider as you attempt to nurse your plants through times of drought.

First, do not fall for the old, timeworn, and mostly indefensible excuse that once a plant matures, its roots have grown down into the water table and do not need irrigation. In most areas of the county, the water table is considerably below the depth where plants, even the deep-rooted native mesquites, can send their roots. Unless you have plants growing along the flowing parts of the Gila River, or you have a rare hanging water table under your property, your plants are simply not going to be able to get by without irrigation.

If you have a tree or shrub that you do not water but is doing well during this drought, you need to figure out where the water is coming from. Perhaps a neighbor is irrigating their lawn next door, or a sand wash has provided extra runoff water. Another far too real possibility is that the plant roots have found the sewer line or septic tank.

The need to provide sufficient water in the right place at the right time is the reason for having an irrigation system. Whether irrigated by flood from the hose or dripped from plastic lines and emitters, it is a simple matter to provide trees, shrubs and garden plants with sufficient water to prevent long-term damage and death.

Even though we may be diligent in providing water at the proper time and in the proper way, a long-term drought requires attention to detail. The extra-dry air and soaring temperatures work together to increase the stress upon even native plants. These severe conditions require some extra work on our part during the warm, dry months of summer.

Second, know the age and size of all your plants. All plants, even desert-adapted plants, need more water when they are young or when they have been recently transplanted. Plants falling in these categories simply do not have the root system to gather sufficient water to carry them through the peak demand conditions of dry and hot conditions.

Third, remember that trees and shrubs will require different amounts of water. Newly planted shrubs, when daytime temperatures are over 100° may need to be watered every day until they get established. Once they start putting out new growth, we can begin to breathe a little easier. During the first year, shrubs should be watered at least every 3 to 7 days depending upon soil type. Sandy soils will need to be irrigated more frequently than clay soils. During the second year of growth, water shrubs every 10 days. After two years, most desert-type shrubs should be able to get by with being irrigated every 2 weeks.

For trees, water first-year trees once a week and 2 to 5 year old trees every 10 days. After five years, it is a good idea to gradually extend the interval between irrigations for desert trees to 4 weeks. Remember that non-native landscape trees, such as mulberry, ash and elm will require more frequent irrigations to maintain good health.

Fourth, be sure to water deeply every irrigation. This will help to encourage deep root growth. About every fifth irrigation, water for longer periods of time to leach out harmful salts that might have accumulated in the soil root zone.

Finally, if the monsoon rains arrive, the increased relative humidity will ease the demand for water and much of the danger will be past. If the monsoon proves to be a bust, do not let down your guard until the temperatures go below 100°.

During the current drought, the native plants in wild communities are going to have to struggle in order to survive. Properly irrigated, our landscape plants will not have to go through that misery but any mistakes that we make in our irrigation technique could spell trouble.
Extension Master Gardeners are individuals who love not only to grow plants themselves but also enjoy helping others. I invite you to visit with them whenever you might have a gardening question.

The Cooperative Extension Master Gardener program first began in the state of Washington in the early 1970's. Because of its success there, it was adopted in state after state. Our Pinal County program began in 1982 when we trained our first group of volunteers. It has grown in numbers of volunteers and service hours since that time.

So, you ask, just what is an Extension Master Gardener? Master Gardener volunteers are individuals who are certified by the land grant university or college within a particular state to work along side a local Extension professional to help plan, deliver and evaluate local garden and landscape programs. In Arizona, the University of Arizona is the land grant institution that conducts Extension programs statewide.

Certified University of Arizona Master Gardeners volunteer to serve, fill out an application indicating their gardening experiences and why they want to serve, successfully complete a rigorous sixteen-week training program and pass a certifying examination that allows the University to accept them as trained and certified volunteers. To complete their certification, they must perform fifty hours of service during the first year and then twenty-five hours every year thereafter in order to maintain their certification. They must also report six hours of approved gardening education each year. They have to stay current in their knowledge.

Why do we use the name “Master Gardeners?” There are many meanings for the term. I know for a fact that there are many gardeners throughout the county, state, country and world who are masters of the skills needed to grow a successful garden. They quite appropriately could be called master gardeners. I have met many during my career and have nothing but respect for them and their skills. In an alternative meaning, you will occasionally hear of people who use the name master gardener to gain credibility so that you will buy something from them. Master Gardeners, with capital letters, is a title used to describe Extension volunteers.

When we talk about Extension Master Gardeners we are really talking about everyday people who have gained experience and want to share it. You can be sure that none of our Extension Master Gardeners are in it for the money. As volunteers, they do not get paid, except in the satisfaction of knowing that they have helped someone. They will not try to sell you a product; and they certainly are not in it to have people look at them as fountains of all knowledge. My Master Gardeners, if you asked, would simply say that they are willing to learn and want to share. You can be sure that when they answer your question, they are giving you local, research-based information authorized by the University of Arizona Cooperative Extension.

While some Extension Master Gardener programs focus on a few projects or tasks, in Pinal County we tend to take a broader approach. The projects in which our volunteers are engaged are often a reflection of their own interests and experience. In every case, you will note enthusiasm for what they do and the love they have for plants.

In Pinal County, our area of service is so large that we have several nuclei of volunteers. We call these individual clusters “working groups.” Currently there are five working groups countywide, which are: Central Pinal County, focusing on Coolidge, Eloy and Casa Grande; Maricopa, housed at the Maricopa Agricultural Center; SaddleBrooke on the south side; Superstition Mountain in northern Pinal County and the San Tan Valley working group.

All working groups do some of the same stuff but also have additional projects that are unique to their area. Master Gardeners in working groups interact with the public. All answer questions and share insights when contacted. Some sponsor and teach at public seminars, others give lectures and help teach down to earth, non-university credit classes. Still others help me conduct field research or communicate through written and electronic media. Some answer garden calls, organize field days, operate office equipment and take care of teaching collections; and these are just a few of the many projects we have going on. However, the working groups each are different in key ways.

- What Is A Master Gardener. . Continued on Page 4
The Greater Casa Grande area working group works in direct support of the local Extension office by duplicating and collating many of the bulletins available for distribution from the office. They also sponsor booths at Pinal County Fairground events, like the county fair and other activities. They conduct a plant clinic on the third Thursday of the month from 9am to noon here in the office conference room.

The Maricopa working group focuses on answering plant questions and to diagnosis plant problems, by either having the sick plant on hand, or working off a digital picture. They also do research and public outreach by managing a demonstration garden and orchard at the Maricopa Agricultural Center.

The SaddleBrooke group is located so far south that many of the volunteers have a Tucson mailing address, but they all live and pay taxes here in Pinal County. They offer plant clinics, diagnostic services and seminars in their community.

The Superstition Mountain working group sponsors demonstration gardens, public seminars and other educational activities in the Apache Junction, Gold Canyon and Superior areas. They also volunteer many hours of service at the Boyce Thompson Arboretum.

The newest working group is the San Tan Valley working group. Like all these working groups, their focus is on supporting the Extension office by helping to diagnosis plant problems and is currently working on putting together a green house project.

On an annual basis, our volunteers turn in between 5,000 and 8,000 per year, depending upon the projects available and the number of volunteers in the program. Currently we are averaging about 110 certified volunteers countywide. The value of their service to me and to the Cooperative Extension is immeasurable because of all the good they do. However, from a purely monetary standpoint, if we multiple the hours donated by the current rate for volunteer service, currently $22.83 per hour for Arizona (Independent Sector) the value contributed by Pinal County Master Gardeners is $114,000, or roughly a little over two paid staff positions. That is a lot of value.

I am truly grateful for their service. If this sounds like fun, and you would like to get involved, we would welcome any who might be inclined to join one of our working groups. We will find a project that matches your interest and that will benefit your community.
The arrival of summer temperatures should be an alarm for tomato growers to carefully check their plants for insect pests and other problems.

Warm temperatures are both helpful and challenging for garden tomato plants. On the helpful side, the warm temperatures motivate the vines to grow quickly. The greater the growth, the more opportunity there is for flowers to appear. On the other hand, increasing temperatures often reduce fruit set, particularly in some of the more sensitive varieties. This challenge often limits fruit production during the warm season. If there is to be any hope of lengthening the time of production, and keeping the plants healthy until the fall season arrives, it is important to identify and solve as many of the other non-related problems as possible. Let’s consider some of the more common problems.

First, let’s address plant nutrition. No matter in what growth stage your particular plants are found, now is a good time to provide them with a little nitrogen fertilizer. A moderate feeding will give them a lift and help the plant focus more energy into producing fruit. A shortage of nitrogen can be devastating to both plant growth and fruit production because it is one of the key elements for growth and development. A shortage at this time could stunt the plant and seriously reduce fruit set and development.

Another key problem could be that lack of water. The onset of hot weather is a perfect time to evaluate the irrigation system and the timing of irrigations. Tomatoes do not do well when they are short of water. In warm weather, all plants will be using more water to help cool themselves and to move nutrients around to where they are needed. On the dry side, tomatoes, or any plant, cannot perform these essential functions. In tomatoes, poor fruit production is the usual outcome. If you have not already done so, consider putting in a drip irrigation system with a timer so that water will not ever be a limiting condition.

This is also the time of year when you may find a large caterpillar with a predominant horn on its hind end feeding on the vines and fruit. The tomato hornworm can reach four inches long and almost as big around as a finger. The large size of this animal makes it bulky enough to consume entire leaves and small stems. In addition, it is a sure bet that no one wants to find a worm chewing on that nicest tomato in the patch.

Tomato hornworms can be hard to find in the garden. They are dark green in color, which matches the color of the foliage of the vines, and they have silver to white lines arranged diagonally along their bodies which gives them a bit of camouflage to hide them from their enemies. Sometimes it is easier to look for their large, black droppings that may be on the ground on settled onto leaves. If you see the droppings, look around closely because they will be there, somewhere.

The best way to get rid of hornworms is to simply pick them off by hand or to snip them with shears. It is quick and easy to do. When they are small, *Bacillus thuringiensis* may also give some relief. If they have been a particular problem in the garden, rototilling after harvest will get rid of resting pupae which have burrowed into the soil to wait out cold or hot temperatures.

Aphids can also be a problem in tomatoes. Aphids are soft-bodied insects that remove valuable juices and nutrients through sucking mouthparts. Since almost every aphid at this time of year is a female, and because aphids give birth to live young, populations can explode quickly. The problem is further enhanced because female aphids do not need to mate to produce young. One aphid today can mean thousands tomorrow, their reproduction is that rapid.

Check regularly for aphid populations in the garden. Especially look on the underside of leaves because they prefer the bottom surfaces. It protects them from the environment and enemies. However, they will also be found on the upper sides, so check both sides.
Predator insects like lady beetles and lacewing larvae will clean up an aphid infestation quickly but sometimes considerable damage can occur before the problem can be completely resolved. Help the natural predators along by washing the plants off early in the morning with a strong stream of water from the hose. Once the aphids are off the plant, it is difficult for them to return. It may take several treatments at regular intervals to keep the aphids washed off. Remember, they reproduce quickly.

Another pest that is often prevalent but easy to miss is the tomato russet mite. This mite is not easily seen without magnification. If fact, it is hard for me to see with a ten power hand lens even when I know what I am looking for. They are best seen under a good microscope such as the one that I have in my office. If you think you might have mite problems, bring in a leaf sample and either I or one of our trained volunteers will help you look.

Tomato russet mites are rose-colored, conical-shaped mites with eight legs. They are good at crawling around and finding fresh feeding sites. When their populations explode, they can suck the life right out of a leaf and eventually the plant. The most common symptom of russet mites are leaves that turn yellow, wilt and then turn tan as they die. Some have described the condition as a plant that is “melting.” For more information, and photos, take a look at the University of California, Davis integrated pest management website. Just type in tomato russet mite into your browser and you will find a wealth of information on this pest. I like the UC Davis site best. Insecticidal soaps are a good first step in controlling these pests.

Sometimes tomatoes in local gardens grow beautiful, full vines but do not set fruit until fall. Even then, fruit set will be sparse. A common observation is to see the plant put out lots of flowers but shortly after see the flower abort or drop off the plant before setting fruit. This particular problem may be a result of that particular variety’s sensitivity to desert conditions. If this problem happens to you, consider planting another variety next season.

Finally, protect tomato fruit from sunburn. The harsh sun can quickly burn tender fruit and leave them with yellow or brown spots in the fruit. Place a good nursery shade cloth, or even a layer of burlap, on a frame above the tomato vines. The shade will allow sufficient sunlight into the canopy of leaves to produce the energy necessary for plant growth while screening out the harshest rays.

Tomatoes are a great garden treat at any time of the year. The marvelous taste of fresh garden-ripe tomatoes can finish off that tossed salad or fresh-grilled hamburger. With a little planning and good care, tomatoes can be a great addition to any garden.
While the weather has recently been quite nice for the end of May, one thing we know: sooner or later it will get hot. When that happens, plants of all types are at risk.

As temperatures warm, plants wake up from their winter dormant period and begin to grow. Trees leaf out, decorative flowers bloom, and vegetable gardens suddenly look like they will actually straighten up and start producing. The down side, of course, is the certain knowledge that the hot temperatures and dry heat of summer are just around the corner. Are you and your garden and landscape plants ready for this critical and often deadly time?

We see it every year: favorite plants do not survive the summer, particularly in June and July. Why is this? It usually can be traced back to the lack of proper care during these high stress months. Let’s take a few minutes and review the basics of soil, water, and plant relationships so critical to protecting garden and landscape plants.

First, always provide sufficient water to meet the particular demands of the plant. Chilean mesquite trees, for example, will generally need less water than a bed of Vinca. Cacti need only an occasional irrigation, while an ash or mulberry tree may need to be watered every three or four days during the hot season. Always know, and provide, the relative amount of water needed by specific plants.

Second, be sure to place the water exactly where it is needed. Providing water only near the trunk of a large tree will not do the tree any good. Most of the feeder roots that collect water and nutrients are out at the extreme edges, or the “drip line”, of the tree. For some plants, like desert trees and shrubs, they can be even further out from the trunk. For irrigation water to provide maximum benefit, it needs to be placed where the plant can make best use of the moisture.

Third, understand that water is critical for cooling plants. Most water absorbed by plant roots is used for transpiration, the loss of water vapor through the leaves. At the end of its trip through the plant, water enters open spaces between the cells of the leaves where it evaporates and exits the plant through tiny holes in the leaf called stomata. This movement of water vapor out of the plant acts much like an evaporative cooler by removing excess heat and leaving the leaf tissue cool to the touch. Supplying enough water to keep the transpiration process going is a critical step in protecting landscape plants in the desert. Insufficient water at any time during the growing season can seriously damage plants.

Fourth, schedule irrigations carefully. Even though a particular plant may need a certain amount of water through the summer months, just about all plants will require their roots to be exposed to air at least some of the time. Waterlogged, always-wet soils often lead to water mold root rot problems that can also seriously damage plants. When scheduling irrigations, be sure to allow the soil to dry somewhat so that air can return to the soil and give roots a chance to breathe.

Fifth, check all equipment on a regular basis. If you have a sprinkler or drip irrigation system, it is important to check each part every so often, to make sure if it is functioning properly. Check for clogged or misdirected sprinkler heads. Are drip emitters working correctly or do they need to be removed and cleaned? Sometimes plastic tubing or PVC pipe will develop leaks or sustain damage from animals or soil tillage. All repairs should be made as promptly as possible to avoid water stress to plants and to save money.

Sixth, control salts in the soil. All soils and waters in Arizona contain at least some dissolved salts with some being more salty than others. In the Casa Grande Valley, most water supplies are fairly good, but if care is not taken, salt can build up within the root zones of all plants no matter where they are located and cause major damage, depending upon the susceptibility of the plant and the overall concentration of salts.

Control salts by adding enough water to the soil to move the lower edge of the wetted pattern deep enough to reach...
beyond the lower roots. If you suspect that sodium may be a problem, an application of gypsum may be in order. With a drip system, irrigations may have to occur more frequently, perhaps every other day or so depending upon the type of emitters used, but water applied to the soil should still be deep and wide enough to leach extra salt from the root zone of plants.

Finally, check the soil moisture level frequently until you know the pattern for wetting and drying during the course of the irrigation cycle. Different soils require different amounts of water and one soil that can absorb large amounts of water, like sandy soils, may not hold true for other soils like clays that cannot absorb water quickly. Testing the soil is one way to know exactly what the moisture level is and to make good decisions about when and for how long to irrigate.

The best way to determine irrigation frequency, which is influenced by the temperature, type of soil and the evaporation rate of water from the soil surface, is to dig down about six inches into the ground and pick up a handful of soil. If the soil remains in a hard ball after it has been squeezed, it probably is still moist enough to support plant growth. If, however, the ball begins to crumble when the hand is opened or if the soil is starting to feel dry, it is time to water.

With this one quick and simple test, anyone can properly determine the correct irrigation frequency for the specific conditions in their own yard. Don’t forget that the irrigation frequency that supports proper plant growth in the winter and spring will probably not be sufficient in the summer when temperatures go up dramatically.

The importance of maintaining good soil moisture in the root systems of all plants cannot be overstated. Throughout the county, there are far too many incidences of needless heat-injury to garden and landscape plants. It is needless because the severe injury of high temperatures could be avoided by following good plant care practices.

Hot weather can indeed be deadly to plants. With careful planning and by paying close attention to the conditions of our outdoor plants, summer damage can be held to a minimum.

If you have questions about this newsletter, have any plant related problems, or wish to have a publication sent to you, please call (520) 836-5221 x204 or (520) 374-6263 and leave a message. If you have a plant problem and are able to email a picture, please send a picture with any information you can provide about the plant, and your contact information to our diagnostic team at macmastergardener@gmail.com and a Master Gardener will contact you.

This newsletter is available to view on our website at: http://extension.arizona.edu/pinal

Richard D. Gibson
Extension Agent, Agriculture

RDG/te/sh/aw

59 mailed copies
262 emailed
Have a sick plant or just questions about caring for your plants?

Visit our Plant Diagnosis Clinic held every third Thursday of month from 9:00 am til noon at the U of A Cooperative Extension 820 E. Cottonwood Lane, Bldg. C Casa Grande, AZ 85122

Or you may call the Maricopa Agricultural Center at (520) 374-6263 and leave a message.

If you are able to email a picture, please send it with any information you can provide about the plant, and your contact information to the diagnostic team at macmastergardener@gmail.com and a Master Gardener will contact you.

The next Garden & Landscape Short Course will be in held at the

SRP Service Center, Eagle Conference Room, 3735 E. Combs Road, San Tan Valley, 85140 from 9:00 am to 12:00 pm.

Classes run from August 23, 2017 to December 13, 2017 from

For more information or to pre-register, please call Lynne Davis, 480-464-4627 or Mary Nielsen, 480-882-1897

How to connect with Rick Gibson online...

Blog: Booming Deserts ricksgardenspot.blogspot.com

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