Don't you just hate it……the first tomatoes of the season are ripening and then a small brown wet looking spot appears on the blossom end of the fruit. It grows and soon the bottom of the fruit is dark and sunken and downright ugly. This is blossom end rot. In my garden it is usually a problem in the spring but it can also happen in the fall.

There are a couple of issues that need to be addressed to combat the problem. Blossom end rot is caused by a lack of calcium. Calcium is needed for cell wall development. It may not be a lack of calcium in the soil. In our area it has more to do with plants having problems taking up the calcium they need. It occurs during sustained drought or uneven watering and when the plant has a heavy fruit set. In water-stressed plants, the calcium moves very slowly in the plant.

The best way to combat the problem is to thin young fruit if the plant is overloaded with it. Then assess your irrigation practices. Tomatoes don't like cycles of very wet and very dry. Good even watering practices will prevent problems. Mulch, mulch, mulch and then water less frequently but deeply. If you don't mulch you can compensate by having soil with very good drainage and watering often. The key is maintaining an EVEN level of moisture in the soil. Blossom end rot will also affect peppers and eggplants.

Curly-Top Virus
Fortunately I haven’t been afflicted with this problem too often but it can be a frequent disaster in the County for many gardeners. There aren’t any good solutions either.

The virus is passed from plant to plant by the beet leafhopper. This small insect feeds on many different crops—tomatoes, beets, beans, squash, melons, spinach, cucumbers, peppers, potatoes and others. It also feeds on some weeds and ornamentals.

The first sign of the virus is puckered and stunted leaves. The leaves curl and roll upward while the petiole curves down. The leaves also take on a leathery appearance and turn yellow.
virus will eventually kill the plant and even if the fruit ripens it may taste bitter.

The leafhoppers are a common western pest and spraying is not an effective way of control as their preferred food crop is not your tomatoes but weeds. Your tomatoes were handy when the insect wanted to feed. Russian thistle is a favorite; so one control method is to control the weeds in your area. Unfortunately, as these seasonal weeds die and dry up, your lush garden becomes a target. The plants can be covered with something like a spun-bond polyester product or any fine mesh barrier that the insects can’t get through.

There are four tomato varieties that are resistant to curly top virus—Roza, Rowpac, Columbia and Saladmaster. If you have had serious problems with the virus you might try to find one of these varieties and give it a try. Remember they are resistant—not impervious and Jeff Schalau says they aren’t that great-tasting.

**Hornworms**

Everyone talks about hornworms, but for a small garden they are the easiest problem to solve. Grab them up and squish them or feed them to your dog, if the dog is so inclined to enjoy them. I’ve heard of people doing that. Dump them in the garbage, throw them in your neighbors yard or use your imagination. In a small garden even the worst infestation can be controlled. Patrol the plants and remove any you see. With their green coloring they can disappear into the foliage, so sometimes you need to look carefully but control is easy. If you must spray something, use Bt. It’s approved for organic gardens, but read the label, there are several different types. Make sure you get one that controls hornworms.

**Cracking**

I’m sure you have had chasms like the Grand Canyon appear on your fruit. While unsightly, the fruit is still edible. It is the result of erratic or excessive irrigation. Dial back that water (see blossom end rot!) and some of the problem could go away. On the other hand, some varieties are just more susceptible than others. Try something new.

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**Soil Solarization**

by Nora Graf

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Been plagued by problems—weeds, insects, wilts etc? If you have a small area, a technique to clean up your soil is solarization. It is just a way to heat the soil up and kill a bunch of stuff. This technique can rid you of things like Fusarium and Verticillium. It can kill weed seeds, mites, nematodes and a few other things. It is a good solution for some problems, but not all!

If you decide to use solarization, it is a simple technique using a few inexpensive or free supplies. The biggest expense will be CLEAR, (Not black—CLEAR!), 1 ½ to 2 mil, plastic. 4 mil plastic or greater actually reflects the solar energy and reduces the effectiveness of the process.

Plastics break down quickly because of UV rays. Most plastics will last the 4 to 6 weeks necessary for treatment. If you want plastic that will last longer, you can buy plastics with UV inhibitors.

First, clear the area of weeds, clods, rocks and any large debris. You want the site to be flat and level. You also want the plastic to have good contact with the soil. Once you get the area cleaned up and the soil broken down into small bits, water thoroughly. You want the soil wet and the water to go deep. It won’t do you much good if only the first inch or two is wet. Water apparently also makes some organisms more heat-sensitive. Dig a small trench around the edge of the plot.

Now, cover the soil with the CLEAR plastic. (I hate to be repetitive, but there is a bunch of people who persist in wanting to use black plastic.) The less space between the soil and the plastic, the better the process will work. Make sure the plastic is large enough to go over the trough. Fill in the trough along all the edges with soil so the plastic is at the bottom of the trough with the soil on top. You want to seal the moisture in. If it is really hot and sunny you will still need 4 to 6 weeks before you take the plastic off. Temperatures under the plastic should reach 120°F. Hmm…. I wonder if you could use one of those oven thermometers with the sensor on a cable to monitor the temps. Might be an idea.

Once you feel the area has been sufficiently fried, remove the plastic. When the soil is dry enough you can plant at any time. Some plants will really benefit from such treatments, as the technique seems to make more nutrients available to plants.
Now that summer has arrived with a vengeance, we are reminded once again of the power of the sun as our plants wilt before our eyes. This month I want to discuss how plants use water and cope with drought.

Several months ago I discussed how water is stored in the soil. When enough water is added to soil, it becomes saturated and once excess water drains away is said to be at field capacity. Plants exert a “suction” that removes this water from the soil until the water content drops to a level called the permanent wilting point. When water content reaches this point, plants are not able to “suck” any more from the soil and begin to wilt, hence the term “permanent wilting point.”

Once water enters through the roots, it moves throughout the plant carrying nutrients to the cells and finally ends up in the leaves where it is released into the atmosphere as water vapor. The process by which water moves from the soil through a plant back into the atmosphere is called transpiration. Because it is difficult in practice to distinguish between water that is transpired and liquid water that is evaporated directly into the atmosphere, the combination of both processes is called evapotranspiration.

As you already know, water is vital to the survival of plants. In addition to carrying nutrients and minerals to cells and providing an environment for biochemical reactions, water provides the basis for the physical support of plants. Internal water pressure keeps plants erect, and they wilt when the internal water pressure drops. Finally, the evaporation of water cools the plant much in the same way evaporative coolers cool our homes, maintaining favorable temperatures for metabolic processes. Surprisingly, very little of the water absorbed by plants ends up actually being incorporated into plant tissues. Most is transpired back into the atmosphere. As I stated in a previous article, corn has been estimated to transpire enough water in a single growing season to cover a field to a depth of 15 inches.

Most water transpires through small openings in the leaves of the plants called stomata (singular stome). These tiny pores may be found on both sides of leaves but typically on the undersides. Stomata are very small, their densities ranging from 40,000 to over 650,000 per square inch of leaf surface. Each stoma is surrounded by two specialized cells called guard cells that can be visualized as a pair of lips. By opening and closing, the guard cells can allow or stop the movement of water vapor out of the plant. In most plants, the stomata open when exposed to light and close in the darkness. Thus the highest rates of transpiration in most plants occur during the day with the lowest rates at night. In addition to light, the amount of water inside the plant also influences the opening and closing of the stomata. When the amount of water inside the plant drops below a critical level the guard cells close the stomata to slow down the loss of water from the leaves. Finally, temperature also has an influence on the opening and closing of the stomata. Generally the stomata are closed at temperatures around freezing and progressively open as the temperatures increase. The maximum opening occurs around 90 to 120° F and begins to fall at higher temperatures.

Environmental factors that influence the rate of transpiration include solar radiation, humidity, temperature, wind and soil moisture. Solar radiation affects transpiration by its control over stomatal openings. The more intense the radiation, the wider the openings and the more water vapor escapes the plant. Since water vapor tends to diffuse from areas of high concentration to areas of low concentration, the moisture in the saturate air inside the leaf moves to the outside when the humidity of the atmosphere is low. Temperature influences transpiration by its effect on humidity. The amount of water vapor that can be absorbed into the air increases with temperature. That means that, if the amount of moisture in the air remains constant, the relative humidity will fall as the temperature rises. The lowering of relative humidity increases transpiration by causing more water to leave the plant. On a still day, the water vapor transpiring from plants tends to hang around causing the humidity to be higher near the surfaces of the leaves. If breezes blow this moisture-laden air layer away, the result is a lowering of the relative humidity around the surfaces of the leaves and an increase in transpiration. Finally, plants transpire the most water when they are actively extracting water from the soil. If soil water becomes unavailable the plants close their stomata to conserve water.

From this description you can see that conditions at this time of year in Cochise County produce maximum transpiration rates. This is why plants need so much water during May and June.

(A note: the Cochise County MG Newsletter is available online. They have a great newsletter with lots of interesting articles. Much of the information is applicable to our area. You can find it at: http://ag.arizona.edu/cochise/mg/newsletter.htm)
It's one thing to grow great produce; it's sometimes another when it is time to decide when to pick it. Some plants are easy, others a lot more difficult, but some tips follow.

**Melons**
One of the toughest plants to discern ripeness, I think, is watermelon. The stem doesn't loosen, the color may not change much, and the outside doesn't get soft. So how do you tell? People have their own method: personally I think thumping is one of the most unreliable, but if you are a thumper, go for it. A note, though, different varieties of melons will sound different.

Look at the area where the fruit is sitting on the ground. The green pigment doesn't form at this spot and gradually changes from pale yellow to light yellow and then a brighter yellow as the melon ripens, so look for the bright yellow spot. Immature melons are sort of flat looking, once the melon is ripe, the surface will have become shiny. Last, look at the tendril on the vine closest to the fruit. If it's dry, the theory is that the melon is ripe, or maybe not. It's somewhat unreliable.

Cantaloupes and muskmelons loose their attachment to the stems when they are ripe. A gentle (read gentle) tug on the stem will tell you. If it stays firmly attached, it's not ripe. If it pulls loose, it's yours to take home.

**Potatoes**
Sweet potatoes grow continuously, they don't really ripen. You should wait until the vines have been killed by the first frost. Pick soon after that happens as they are very susceptible to cold and the tubers could freeze, ending their edibility.

Regular potatoes can be picked when the plant starts to flower or you can feel around the outer edge roots of the plants, disturbing the roots as little as possible and pick the larger tubers. Otherwise, wait until the plant starts to dry and turn brown.

**Tomatoes**
Do not pick your tomatoes green and set them on a windowsill to ripen. I see it all the time and I just don't get it. Wait until the fruit is fully colored and the tomato pulls easily from the stem. If you have to yank and jerk at it, it's probably too early. It will be slightly soft and unless it's a green tomato, it should be fully colored.

**Beans**
Different types of beans are picked at different times. If you are picking your beans to eat fresh and green, pick on the smaller size when the pods are still tender. By picking when they are young, the quality is better and it will encourage the plant to produce more. For dried beans, pick when they are fully mature. The pods should be dry or nearly so.

**Summer squash**
Pick when the squash is still young and small. Monster-sized zucchini look great, but aren't as tasty. You can shred it, freeze it and then use in things like zucchini bread and cake. Yum! For fresh eating though, think small.

**Winter squash**
Winter squash should be picked before a heavy frost but if the vine is green and growing leave it alone. Generally the longer it grows, the sweeter the flavor.

**Corn**
Feel the ears. The kernels should be full-feeling and if you use your fingernail to poke through a kernel, it should have a milky juice. The silks should be brown and nearly dry. I noticed at Hauser Farms last year that they didn’t allow people to open the ear to inspect the corn, so get used to the feel of ripe corn.

**Peppers**
There are a variety of different colored peppers out there, but they all start out green. So if you like green peppers pick them when you see the first sign of color change and they are full and firm looking. But it's better to wait for them to truly ripen. A green pepper is an unripe pepper. Wait for the color to fully mature and then pick. This might take a while longer but the taste is much better!

**Eggplant**
Look for fruit that is firm and brightly colored or fully colored and shiny. Once the shine starts to fade, the fruit is past it's prime. Eggplant comes in purples, whites and stripes so it might be hard to tell sometimes, but a fully colored fruit is one that is ready to pick.
With the monsoons coming (I have my fingers crossed anyway!) there are perennials that you can plant soon and take advantage of the rain. Here are a few tips to keep in mind if you are planning to add something new this summer.

Plan! It’s easy to be seduced by plants in the nursery. I’ve spent more times than I care to remember standing in front of a plant lusting after it, succumbing and then trying to figure out what to do with it once I get home. Planning is a much better idea. Here are a few simple tips before you buy:

1. **Know your conditions.**
   Know your soil. Is it a heavy clay or sandy or in between? Know your climate zone. While it is fun to experiment, and I always recommend that, it is helpful to know where to start. Know your microclimates. Which side or area is shady? Where are the cool or hot spots?

2. **Check bloom times.**
   If you want continuous color you will need this information.

3. **Size is important!**
   Don’t put a 12 foot shrub into a 6 foot space. It is just not going to work in the long haul. Dealing with a plant too large for the space can be heartbreaking. You either have to prune it excessively, likely making it look ugly, or you will need to make the tough decision to pull it out.

4. **Read the labels!**
   That will give you the information necessary to make an informed decision.

5. **Buy plants that look healthy.**
   Check on the under surfaces of leaves, make sure the leaves are nice and green and are not infested with insects. Sometimes native desert plants are less than stellar looking in the container. They seem to take time to come into their own after they have had time to grow in place. So don’t dismiss a plant because it is less than lush. Do make sure that it doesn’t appear to be overly leggy and does look good for that type of plant. Avoid anything that is wilting or loosing its leaves.

6. **Pick a plant without blooms if you can.**
   It’s nice to have blossoms, but if it does it really isn’t the optimum time for transplanting. The nursery trade sells more if the plants are in bloom when they are put out for sale, but try to resist and find one without blooms.

7. **Be prepared to be firm about your choices.**
   There is always going to be something that stops you in your tracks, that you have to have, even if in your heart you know it won’t work in your yard.

Registration for the Master Gardener Highlands Garden Conference will be available soon! It will be a great conference, so hope you will be joining us in Prescott.

October 21-Pre-conference Activities
October 22-Conference
The Myth of Xeriscaping
“Use of drought-tolerant plants reduces residential water consumption”

Linda Chalker-Scott, Ph.D., Extension Horticulturist and Associate Professor, Puyallup Research and Extension Center, Washington State University

Linda Chalker-Scott will be a keynote speaker at the Master Gardener Conference in October.

The Myth
With summer approaching and the prospect of water shortages looming, many of us are searching for alternatives to water-hungry lawns and annuals. In areas where arid summers are typical, the search often leads to xeriscaping, or landscaping with drought-tolerant trees and shrubs (xeriphytes). Not only do these landscapes survive with significantly less irrigation, they harmonize with the natural landscape. It is a pleasure to see these more environmentally appropriate landscapes replace the turf-and-petunia gardens so prevalent in the southwestern U.S. In addition to their drought tolerance, native xeriphytes offer habitat to native mammals, birds, insects, and reptiles. What could possibly be wrong with this picture?

The Reality
By definition, xeriphytes are adapted to drought; this does not mean that they don’t like water. In fact, xeriphytes are particularly adept at taking up and storing water when it’s available. One study demonstrated that mesquites – a staple of xeric landscapes – use more water than oaks under optimal conditions. The more water the plant stores, the more it can grow; new leaves appear and succulence increases. Many of these xeriphytic plants shift to a more energy-efficient form of photosynthesis if water is not limiting. We’ve all seen how well cacti and euphorbs grow in a greenhouse or home environment, but under natural conditions growth is much reduced. During the transition from moist to dry conditions, xeriphytic species often shed their leaves to reduce moisture loss and enter dormancy. Drought tolerant species can tolerate drought…but they grow slowly under droughty conditions and often are less aesthetically pleasing.

What this means in terms of water management is that xeriphytic landscapes can induce residents to use more water than they would with traditional landscapes. A study in Arizona several years ago demonstrated that homeowners understood the ecological principles behind xeriscaping, but their desire to have an aesthetically pleasing landscape translated to increased irrigation. Ironically, those homeowners most concerned about water shortages and conservation used more water than their neighbors with traditional landscapes!

For “water-wise” landscapes to be truly effective in conserving water, homeowners and other landscape managers need to develop a different philosophy of landscape aesthetics. No plant will grow vigorously without adequate moisture, but drought-tolerant species will survive prolonged droughts. We need to be able to accept the bad – the leaf shedding and reduced growth – with the good.

The Bottom Line
• Any newly-installed tree or shrub, drought tolerant or otherwise, requires adequate irrigation to establish a sufficient root system.
• Established, drought-tolerant trees and shrubs can survive with less water than typical landscape plants.
• If water is available, many drought-tolerant species use more water than typical landscape plants.
• A drought-tolerant, water-conserving landscape is not going to grow as quickly or vigorously as the same landscape under increased irrigation.

For more information, please visit Dr. Chalker-Scott’s web page at http://www.theinformedgardener.com.
MG News

Fiscal Year Ends June 30th
Remember to submit your hours for the fiscal year by July 5th so that the books can be closed. If you don’t have the required hours (25 Vol and 6 CE), you may request a waiver from Jeff Schalau to maintain certification. Contact Mary Barnes with questions, mcbarn1@cableone.net, 583-0889.

MONSOON MADNESS
The third annual Monsoon Madness Plant and Yard Sale will be held July 9, 7:30am to 1pm. This is the “big event” for raising funds for The Association. Prescott Extension Office parking lot. See you there!

The Prescott Area Society Rhizome Sale will take place in three locations this year. We will also have reblooming iris for sale.

Sharlot Hall Museum, Prescott
Saturday, July 16  11 am - 5 pm
Sunday, July 17  12 pm - 4 pm

Warren's Hay-N-More, 694 N. Hwy 89, Chino Valley
Thursday, July 21
10 am - 2 pm

Dan's Garden in Yarnell
Saturday, July 23
10 am - 2 pm
Follow signs across from the Ranch House Restaurant

Verde Valley Farmers’ Market
June 11 - October 1, 2011, Saturdays, 8:00 am - 12:00 noon
Ramada next to Ft. Verde State Park, on Hollamon Street, off of Main Street, Camp Verde, AZ.

Congratulations!
on completing 50 Volunteer Hours

Janice Latrell
Jennifer Warren—mentor Michele Herrick

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

There is no meeting in July, but Monsoon Madness Plant and Yard sale is scheduled for July 9 at the Prescott Extension office. 7:30am to 1pm.