The Garden & Food Safety

While we would like to think that our gardens are safe havens from food borne diseases, we should not be complacent. A lot of things can happen with garden produce from the garden itself and before it is put on the table. Food safety should be an issue whether you pick your own, buy at the farmers market or buy from a super market.

In the United States the number of food-borne illnesses range from 24 to 81 million cases per year. Approximately 20 different bacteria cause almost all of the illnesses although 90% are caused by just eight of them. They are Staphylococcus aureus, Salmonella, Clostridium perfringens, Campylobacter, Listeria monocytogenes, Vibrio parahaemolyticus, Bacillus cereus and Escherichia coli. All of these can be found on raw food and don’t make the assumption that they can’t be in your back yard right now. Now that I’ve scared you I want you to know that most of the food we eat is free of pathogens.

Staphylococcus aureus is found in respiratory passages, skin and superficial wounds. The toxin that the bacteria create is not destroyed by heat. It is found most often in foods that are prepared, as in potato salad, ham salad and sandwich spreads. Since these are often picnic foods it means they are sometimes left at room temperature too long. This allows the bacteria to thrive and produce toxins.

Salmonella is probably the one we are most familiar with. It is found in the gastrointestinal tracts of animals and humans. Often times people think it is just found in meat products but it can be found on any type of food. It is destroyed by heat. Contamination of food can come from many sources and is made worse by not cooking or cooling the food enough.

Clostridium perfringens is found in soil, dust and the intestinal tracts of animals and humans. It isn’t the most common cause of food poisoning but it is one of the deadliest. Death happens in about 30% of the cases. The most common culprit is home-canned food.

Vibrio parahaemolyticus is found in seafood. It needs a salt environment and is sensitive to cold and heat. If food isn’t cooked enough or cold enough, food poisoning may result. In places like Japan where seafood is often served raw, it can be a major problem.

Bacillus cereus is one of the lesser-known pathogens and
Escherichia coli is a significant cause of diarrhea and is usually caused by poor sanitation. It is the one mostly associated with “Montezuma’s revenge” or “travelers diarrhea.” The major source of E. coli is from feces. Poor sanitation and untreated water is the main source of infection. A ninth is not common but has been found in the United States. Yersinia enterocolitica can cause a very serious illness that rarely kills. It just makes you feel like you want to die. The severe gastroenteritis is sometimes mistaken for appendicitis which has led to unnecessary appendectomies. It can grow in cold conditions but is sensitive to heat.

Listeria monocytogenes is another one that makes the news on a regular basis. Before the 1980’s the cause of the disease was only related to cattle and sheep. Since then the bacteria has shown up in other sources and has become a serious food poisoning problem. It is especially dangerous because it can survive very adverse conditions, including in your refrigerator, and isn’t killed until temperatures reach 170 degrees.

Campylobacter jejuni is transferred from animal origins to humans but is easily transferred from human to human by fecal contamination. It’s not the sturdiest of bacteria and doesn’t do well in ambient temperature and grows poorly in food. Good hygiene is the best deterrent.

It can grow in cold conditions but is sensitive to heat. Especially for our hard desert soils but they can be a source of bacteria. Use only well-composted manures or heat-treated manures. Do not use manures from pigs, dogs or cats on your vegetables. They can carry parasites that you can pick up and are not destroyed by composting. Allow plenty of time for the manure to compost before using it. If you are using raw or poorly composted manures do not use on the food plants. They can be used on landscape plants but mix them into the soil about 60 days before planting—just be careful of cross-contamination. Mix any manures in well; pathogens do better on the surface of the soil versus being mixed into the soil.

Graywater can be a source of contamination. It might be good for landscape plants, but, if you are washing diapers, water from the washing machine is not something you want in the garden. You never want to spray it on the plants; apply directly to the ground.

Now that I have you terrified to ever eat anything again, some simple things will help you to stay safe: WASH HANDS!!! Can’t emphasize enough that the simple act of handwashing frequently while preparing food can prevent a lot of problems.

Wash fruits and vegetables before using them. Wash and sanitize cutting boards, knives and anything that comes into contact with food before you start handling it. A simple solution of 1 teaspoon of bleach per 4 cups water is the best sanitizer out there. The utensils and cutting boards should be completely covered in the solution and then let sit for several minutes and then dry with paper towels or a clean towel and you are set. Easier than coping with stomach cramps for a couple of days, right??!! Keep food refrigerated below 40 degrees. If you are going on a picnic, keep the food in the coolers until you are ready to serve. Don’t leave it on the table for long periods.

Serve hot foods hot. Don’t let them sit on the table cooling.

If you are making large quantities, store them in small containers. Smaller containers will cool faster than a large container of food. On the other hand you don’t want to put hot food directly in the refrigerator. It can raise the temperature inside. Keep food under 40 degrees or over 140 degrees. Anything in between is fair game for bacteria.

Heat canned food thoroughly before tasting. ALWAYS follow approved home-canning procedures. They are available at Cooperative Extension offices or from USDA bulletins. When you are not sure if the food is good any longer, the best thing is just to throw it away.

Manures are a great source of organic matter, especially for our hard desert soils but they can be a source of bacteria. Use only well-composted manures or heat-treated manures. Do not use manures from pigs, dogs or cats on your vegetables. They can carry parasites that you can pick up and are not destroyed by composting. Allow plenty of time for the manure to compost before using it. If you are using raw or poorly composted manures do not use on the food plants. They can be used on landscape plants but mix them into the soil about 60 days before planting—just be careful of cross-contamination. Mix any manures in well; pathogens do better on the surface of the soil versus being mixed into the soil.

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Master Gardener (Coconino County) Kathy Pendley-Shaw began the demonstration garden in SRSP five years ago so her daughter could help garden the same land that her great-grandfather had homesteaded over 100 years ago. (Frank Pendley homesteaded at Slide Rock in the early 1900’s and the family farmed there until 1982.)

Rangers help water and volunteers (Friends of Slide Rock) plant, weed and tend the garden in season. Like many gardens, it has become better each year—amending soil, improving fences, learning what works in beautiful Oak Creek Canyon. Sedona and Oak Creek Canyon have a long history of agriculture. Long before tourism it was about apples, peaches and vegetables in Oak Creek Canyon.

Today guests from all over the world have enjoyed the garden and apple orchards. Tourists have taken thousands of photographs of the Hopi Red Dye Amaranth, giant sunflowers and vegetables against the red rock canyon backdrop. Volunteers enjoy engaging with visitors, giving tours and answering questions while working in the garden.

We experienced unprecedented events this season; a wild-land fire began May 20th just 2 miles north of the park. Slide Rock State Park was not damaged and no structures were lost in the fire. The 21,227-acre fire has been out for months and Slide Rock State Park looks as beautiful as ever. However, our demonstration garden did suffer loses. It is located next to the water controls and water storage cisterns that the firefighters used to fight the fire. There were Chinook and Sikorsky Sky Crane Helicopters hovering right over the garden for days and hundreds of firefighters camped in the park during that time. Most of the young crops in the garden were lost. Foliage was torn from stems and stems pulled right out of the ground in many cases.

As we moved forward to recover the season, donations of seed and plant starts were very appreciated. We replanted corn seed, which is growing well now. The strawberries are greening up after becoming very wind-burned. It’s not a perfect garden this year, as plans had to be revised and patched together several times; some items had to be replanted 3 times. It has grown and produced and is once more being photographed, sketched and enjoyed.

I began the season as a Yavapai County Master Gardener Associate and will finish the season as a Certified Master Gardener, having had many opportunities to volunteer in the garden and Farmers’ Markets throughout the Verde Valley. Thank you to everyone who has supported Slide Rock State Park and the Friends of Slide Rock State Park. When you visit please stop by the garden where many heirloom vegetables and flowers are growing.

This year we truly consider this our “Victory Garden!” There will be a Fall Festival held as a Homecoming celebration on October 4th at Slide Rock State Park.
“Remember, the yellow verbena only gets watered every other day, everything else in that bed gets water every day,” hurriedly noted my Master Gardener wife as she packed the last of her clothes for her long trip.

“Got it. Yellow Ver-bean-um, once every other day, everything else twice a day . . . Um, err, one more time. Where is the bed again?” I shyly asked.

“It’s the one across from the pond. Also, remember to feed the fish.”

“Fish? Fish? When did we get fish?” My wife closed her suitcase and sighed. “Six years ago . . .”

I’m sure, if you polled Master Gardeners on what their worst nightmares are, leaving their gardens in the care (even if only temporarily) of well-meaning, horticulturally challenged spouses, probably ranks at the top.

I’ve long ago given up keeping track of the plants that now call my wife’s many gardens home. Prior to becoming a Master Gardener, she was satisfied with a simple garden containing flowers, which I not only recognize, but who’s names I could pronounce without major contortions of my lips.

By the time she received her Master Gardener certificate, her gardens had quadrupled in size. The simple varieties that once graced the walkways, perfectly good plants as far as I was concerned, had been pulled out, replaced by obscure, albeit “native”, plants.

Having been given a taste of how spectacular her gardens could be, she moved on to more advanced and focused training at Longwood Garden. Each new class brought eclectic new plant additions and, with them, new garden layouts.

When existing gardens could no longer meet her needs, she simply appropriated more of our ever-diminishing lawn. Soon she was buying weed killer in barrel containers, not to kill weeds, but to eradicate whole portions of the yard to accommodate her latest shade garden, raised-bed garden, or butterfly garden.

As one can imagine, the daily maintenance of such an extensive array of gardens is a Herculean task at best. A task best suited for a Master Gardener, not a Master Gardener spouse! While I have always been ready and willing to help, the scope of my “acceptable” services has diminished inversely to the growth in the size and complexity of the gardens.

At first I was entrusted with planting “hardy” plants, ones that didn’t need the fine touch of a Master Gardener. But my unique ability to step on the most fragile plant in the bed gave her pause. Given my unique ability to kill any plant I touched, weeding seemed a natural. But I got fired from that position for failing to master the technique of pulling weeds out by the root. Since then, my help in the garden has been limited to “safe” activities, like dumping buckets of rocks over the fence line. Anything more than that, my wife claims, would be hazardous to the health and well-being of the gardens.

So, when my wife inquired if I would be willing to take responsibility for watering while she visited her parents for a week, I jumped at the chance to prove myself. After all, how hard could watering be?

I quickly learned that there was much more to watering than turning on the hose, opening a beer and standing around waiting to get bitten by mosquitoes. Apparently, one of the first things you learn when you become a full-fledged Master Gardener, is the secret equation for determining just how much water a plant needs on a daily basis.

The equation is made up of several basic components. At first glance, it was fairly simplistic, and, compared to running a nuclear power plant, seemed like child’s play.

Factors Master Gardeners take into consideration include: deepness of the roots (DR) - the deeper, the less frequent the need for watering; plant height or the tallness of the plant (T) - the taller the plant, the more need for watering; leaf width (L) - the wider the leaf, the more need for watering. Of course, flowering plants (FP) need more water than non-flowering (NFP) plants. Or, in mathematical speak: \((T \times L)/DR\) x (FP/NFP).

A good Master Gardener then adds in some fudge factors. For example: the closer the proximity of plants in a bed (PP) - the less you have to water; the windier the day (WD), the more you have to water; the sunnier the spot (SS) - the more you need to water; the shadier (SS1) - the less you need to water. Or more simply: \((WD \times SS)/(PP \times SS1)\).

Then, of course, one needs to factor in whether the soaker hoses you’ve been meaning to replace for the past five years leak more at the top or the bottom of the bed (SHL), the number of mosquito bites you’re willing to accept in any one time period (MSB) and the number of times you’re willing to fuss with a hose that always seems to kink at the worst possible time (HK). Or more simply: \((SHL)/(MSB \times HQ)\).
Put together, the equation on how much and how often to water just one plant in a Master Gardener’s garden looks like this: 

\[ \frac{((T \times L)/DR) \times (FP/NFP)) \times ((WD \times SS)/(PP \times SS1)) \times ((WD \times SS)/(PP \times SS1)) \]

As a point of comparison, the equation that describes the chain reaction within a nuclear power plant has only six factors, and to calculate that requires some pretty heavy computing power. How Master Gardeners can juggle all these factors and calculations in their head and get it right every time is beyond me, but they do, and their gardens always look beautiful.

Given that the results of my first calculation for my wife’s garden -- 300 inches of water -- was a little bit suspect, I ran the equation on my computer. It crashed halfway through and has refused to start since. Realizing that what was left of my reputation as “mindless” garden help was now at risk, I did the only thing I could think of -- I multiplied the whole equation by zero, subtracted 1, and began to water like my wife buys plants: non-stop.

Every morning I raced the sun to the garden. Juggling the coffee IV and the watering hose took a little getting used to at first, but it was rewarding. Every garden was filled with a capricious array of colors and fragrances. Drooping plants, almost instantaneously rose to meet the rays of the sun after receiving their fill. Bugs of every shape and size, invisible to those who hurry through gardens, suddenly became ever-present. And for the first time, I realized that my wife had not simply created gardens, but whole worlds unto themselves.

Every day I discovered a new collection of potted plants squirreled away in some corner of a garden, all with intended purposes that only my wife could reveal, and all of course, now desperately wilted from lack of water.

In spite of my efforts, it was apparent that I was losing the watering battle. Pulling out all the stops, I fired up the soaker hoses and even enlisted the help of local kids, all to no apparent avail. Finally in desperation, I contacted a local pool water company, and after being assured the water was untreated, contracted for a shipment. As I stood watching the deluge from the tanker flood the gardens, my wife called to check in and remind me: “. . Remember, over-watering is as bad as under-watering …”

http://www.emmitsburg.net/gardens/articles/adams/audrey/garden_watering.htm

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The 2014 Arizona Highlands Garden Conference theme is “Harmony in the Highlands” and will connect natural history and environmental stewardship with science-based gardening practices. The Conference is presented by University of Arizona Cooperative Extension Yavapai County Master Gardeners and is open to all home gardening and landscaping enthusiasts. The content and presentations are specifically geared toward northern Arizona’s unique climate and growing conditions.

The keynote speaker is Dr. Jeff Gillman, nationally-recognized expert in garden pest management and successful home horticulture practices. During the conference, Jeff will present two sessions: The Truth About Organic Gardening and The Truth About Garden Remedies. Most gardeners assume that any organic product is automatically safe for humans and beneficial to our environment, and in many cases this is true. But there are also some exceptions.

Wayne Ranney, a geologist at Yavapai College for 20 years and now at Flagstaff’s Coconino Community College teaches people to appreciate our Northern Arizona geology. Other noted presenters will talk on topics including “Attracting Hummingbirds to Your Yard through Landscaping”, “Growing Milkweed for Monarch Butterflies and why it Matters”, “Landscaping with Native Plants”, “Extending our Short Growing Season”. Other sessions will discuss Northern Arizona tree insects and diseases, the multi-faceted nature of native grasses, and historic gardening in our area.

There are also optional pre-conference activities on October 24 including a Watson Woods guided tour from Prescott Creeks and the Audubon Society, or a Willow Lake guided tour including native plant identification and a restored local Native American pit house, or a guided tour of the historic downtown of Prescott.

There are discounted room rates at the Prescott Resort for those wishing overnight accommodations. Early registration runs until September 24, and is $75 for the conference, which includes topics all day, continental breakfast, lunch, breaks and a welcome bag. Register early - the cost goes to $100 after September 24. Please see the complete agenda and registration information at: www.AHGC2014.org. Tell your gardening friends and neighbors not to miss this fun learning opportunity.
What an exciting time the Age of Enlightenment must have been. Science and exploration flourished. Men and women were beginning to travel the world, seeing and exploring new things, cultures and ideas. Among those explorers were botanists who endured astonishing hardship to collect, describe and bring home new plants. When you read this small history of John Fraser, you should never complain about the small inconvenience, of say, driving a mile or two to go to the grocery store or even the 45 miles to travel to the Prescott or Camp Verde meetings in our air conditioned and heated vehicles.

Fraser was one of the best known plant collectors and explorers of his time. He specialized in North American plants, eventually bringing over 200 specimens to England. They included various laurels, rhododendrons, azaleas and phlox varieties.

John Fraser was born October 14, 1750, in Scotland. At 20 Fraser went to London to work in his trade as a hosier (a draper that works with linen). In London he discovered the Chelsea Physic Garden, which lead him to the field of horticulture. He married in 1778 and continued with his mercantile job but was lured away from it so he could watch gardeners working. He became friends with William Forsyth who was in charge of the Apothecaries’ Garden. Inspired, he became a botanical collector (no record of what his wife thought of the idea!) and he sailed to Newfoundland in 1780. He returned to England and left again in 1783 with his oldest son on an adventure to explore the “New World.” At some point in the 1780’s Fraser established the American Nursery in London.

Fraser collected extensively in various parts of the world and introduced approximately 220 species of plants from the Americas to the world. That time included shipwrecks and pirates, hostile natives and sieges. He spent a lot of time in the Appalachians, the Alleghenies, Georgia and South Carolina. He and his brother even began a nursery in Charleston to raise plants like rhododendrons and magnolias to ship to Europe. Much of his travels consisted of exploring the wilderness in rugged and unmapped territory. Travel by ship was hazardous. In one of his journeys the ship sprang a leak and passengers and crew had to work the pump to keep from sinking.

In 1795 Fraser visited Saint Petersburg, Russia. He sold plants to the Empress Catherine but also brought Black and White Tartarian cherries with him and introduced them in England. He received a commission as Botanical Collector to the Emperor Paul, which prompted another trip to the Americas. While there he and his brother visited Monticello and Thomas Jefferson. They also traveled to Kentucky and Tennessee. A trip to Cuba was planned but didn’t go well. The ship they were on was shipwrecked on a coral reef 40 miles from land and they weren’t rescued for six days. They barely survived the experience.

The Russian connection did not end well. When he returned to Russia in 1805, the new Emperor refused to recognize Fraser’s appointment. It took two years and assistance from the British before Fraser was paid. In spite of that the Dowager Empress Maria Feodorvna commissioned him to bring specimens for the Imperial Botanic Garden. The Russian experience caused him great financial difficulty.

He went back to American but the relationship with his brother apparently soured and the nursery was neglected. In the end he sued his brother for debts.

Fraser’s last trip to the United States came in 1807. During his visit he fell from a horse and broke several ribs. He never recovered completely and returned to England via Cuba in 1810. He died in April, 1811 in London.

His legacy included the Fraser fir (Abies fraseri), Fraser magnolia (Magnolia fraseri), many azaleas and rhododendrons and gentionworts species (Frasera). The Fraser fir is now one of the most common Christmas trees sold.
Congratulations for completing 50 hours

Diana Atkins—mentor—Mary Barnes
Debbie Mayne —mentor—Hope Fonnet
Deb Grafe—mentor—Betty Loos
Shannon Fillmore—mentor—Joni Harvey

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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Yavapai County Master Gardener Recognition Picnic

Saturday October 4th, 2014
Dead Horse Ranch State Park in Cottonwood, River Day Use Ramada

Plan to arrive at 11:30 to visit. Lunch starts at 12:00 noon.
Roasted and fried chicken, drinks, plates and service ware will be provided; MGs provide side dishes/desserts.

Please RSVP to Barbara Saul at bjsaul4@gmail.com, 282-2814. Tell her:
- how many will attend
- what potluck dish you will bring
- with whom you will be car-pooling

The MGA will pay for the $7 car pass, so please share rides if you can.

Passes will be given to you as you enter the park.

Directions:
From Interstate 17 go West at Exit 287 (Highway 260 toward Cottonwood). Continue approximately 11 miles to Main Street in Cottonwood (Hwy 89A) and turn left. Continue through Cottonwood on Main Street (the street will gradually curve to the left). Turn right (North) on North 10th Street. You’ll see a brown information sign for the park before the 10th Street turn. We will be in the “River Day Use Area”.

In Bloom Now!
The Arizona poppy (Kallstroemia grandiflora) is in bloom now. While it looks similar to the California poppy from a distance, they are not related. It’s not even a poppy. It’s leaves resemble mesquite leaves. It blooms in late summer, early fall following the monsoons. It can be found in lower elevations like in the Verde Valley.

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Prescott, AZ 86305

MG NEWSLETTER

Next Meeting
September 17, 6:30pm, Prescott.
Speaker: Wren Meyers, “Farm to School Program”