



The Virtual Gardener—No Water Veggies: Part 2

Last month I reviewed a book titled *Gardening Without Irrigation: or without much, anyway* by Steve Solomon. In the book, Steve described how he developed techniques for growing vegetables in western Oregon using little or no irrigation. This month I want to see if any of his techniques might be applied here in the high desert of southeastern Arizona.

To begin, we note the differences between the climates in western Oregon and southeastern Arizona. Solomon's area in western Oregon receives about 50 inches of precipitation a year, mostly in the form of snow. The area around Sierra Vista in southeastern Arizona receives about 15 inches of precipitation a year, roughly 60 percent of it falling in the summer in torrential downpours. The average annual temperature where Solomon lived is 52°F and the average annual temperature in Sierra Vista is 77°F. High temperatures during the growing season in Arizona run in the 90s or higher and those in Oregon in the 70s to 80s.

Not surprisingly, we see that it's cooler and wetter in Oregon than in Arizona and most of the precipitation in Oregon comes during cooler months when evaporation is lower. That means that we can't use

Solomon's techniques to grow veggies with low or no irrigation in the high desert...right?

Not necessarily! Perhaps we ought to take a closer look.

Over the course of a year in Sierra Vista, 15 inches of rain deliver close to a thousand gallons of water to a 100 square foot area on the ground. How much of that may become available to our plants largely depends on the nature of the soil and the vegetation covering it.

To be useful to our plants, the water must penetrate the soil surface and percolate downward to root zone depth. If the soil surface is compacted into an impermeable layer or covered with dense vegetation or even heavy organic mulch that keeps the water from reaching the soil surface, much of it will either run off or collect on the surface and evaporate before it can penetrate to the root zone.

Even if the water penetrates into the soil, it may not be available to our plants. In coarsely sandy soils, the water may quickly drain away to depths beyond the reach of plant roots. Conversely, in fine-grained clay soils, the water may be held so tightly on the surfaces of soil particles that the plants cannot pull it loose. The ideal soils are deep loams containing

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COOPERATIVE EXTENSION
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roughly equal amounts of coarse and fine inorganic materials and a generous amount of organic material. These soils promote deep root development and hold water tightly enough to keep it from draining away but not so tightly that the plants cannot extract it.

Unfortunately our desert soils often do not meet these criteria. They usually contain little organic matter, may include rock-hard layers of caliche, and often have a shallow, near-surface layer of densely compacted silt and clay. The end result is that vertical root growth is inhibited and water cannot penetrate very far into the soil. Often, however, once water penetrates beyond these dense layers near the surface, the soils beneath hold water quite well.

Solomon was successful in growing his vegetables without irrigation because he had great soils to work with. All he had to do was to space his plants far enough apart so they could develop broad, deep root structures, keep the ground between his veggies free of other plants that would steal water from them, and loosen the soil surface to promote infiltration and inhibit loss of water from surface evaporation. We can apply some of his techniques, but most of us will have to work a little harder than he did. Despite our best efforts, we will likely have to irrigate a little, but maybe not as much.

We need to capture all the water that falls on our property and keep it from running off. One way to do this is by building swales and berms on contour and creating small retention ponds. We can get water off the surface and deep into the soil by mechanically breaking up the near-surface impermeable layers of caliche and clay. I have found swales and berms on contour and “vertical mulches” located in low areas where water collects to be effective. The

vertical mulches are simply holes punched through the compacted surface layers—two feet is usually sufficient depth in my yard—and filled with wash sand. I have also found stone and sand surface mulches to be effective in reducing losses of water due to evaporation. They allow water to percolate downward but inhibit it from wicking upward where it will evaporate from the surface.

So...can we grow vegetables without irrigation in the high desert? Most likely no. But, we can save some of our precious water by doing the things we already do to save water and applying some of Solomon's ideas. We can:

1. Check out heirloom varieties of plants that are a little more tolerant of drier conditions than the pampered hybrids usually found in big box stores.
2. Break up compacted soils in planting beds to promote water infiltration and root development.
3. Amend planting beds with compost to improve their water-holding capacity.
4. Space our vegetable plants far enough apart so that they have room to develop broad, deep root systems.
5. Keep the areas around our veggies free of weeds or other plants that will compete with them for water.
6. Use sand or stone mulches around our plants to reduce surface evaporation, moderate soil temperatures, and reduce wind erosion.

For some inspiration on dryland gardening techniques, check out these YouTube [videos](#) to see how the Hopis grow corn and other crops without irrigation on a hot, barren land on the Colorado Plateau that receives only about 8.5 inches of rain a year.

Until next time, happy surfing!

Gary Gruenhagen, Master Gardener
virtualgardener@cox.net

Cuttings 'N' Clippings

✿ The next Cochise County Master Gardener Association meeting will be **Thursday, May 10** from 2:00 to 4:00 PM. We'll be having a hands-on workshop in the Discovery Pavilion. Cal Kelley will show you how to press, dry, and process flowers from your gardens using a microwave oven, and then make artwork from them.



Wednesday, May 23, Graduation of Class of 2018 from 2:00 to 4:00 PM. For more information contact Valerie at: valeriedavidson@email.arizona.edu or the Cochise County Master Gardeners web site at:

<http://cals.arizona.edu/cochise/mg/>

✿ Water Wise will be holding a Water and Energy Nexus Talk on **Saturday, May 5**, 10:00 AM—Noon at UA Sierra Vista. Learn about the relationship between energy and water use in Arizona. Information on residential solar and wind systems will be available from vendors. For information contact Valerie at: valeriedavidson@email.arizona.edu or 520-8278, Ext 2141.

Check out the Water Wise web site for their 2018 schedule at: <http://waterwise.arizona.edu/>

✿ AZ Native Plant Society meets **Friday, May 18**, 5:00 PM, Cochise County Community De-

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Tent Caterpillars Making Their Appearance!

It's that time of year when Tent Caterpillars begin to make their appearance in trees and shrubs around Cochise County—especially visible now in some of the tall cottonwoods in the San Pedro River area. You could see them in many other species such as apple and ash trees. They are voracious eaters of the new leaves and can cause a great deal of defoliation.

The questions begin: What are they? How did they get there? Will they kill the tree? Do they need to be controlled? How can the caterpillars be eradicated?

First, let's discuss the life cycle of these brown caterpillars, which are the juvenile (immature) form of the various species of the adult brown moths you commonly see fluttering around the street lights and porch lights when you are outside on a summer evening.

The brown adult female moth lays her eggs in the summer in a band around a small tree branch. Even though the eggs mature in 3 weeks, they do not hatch then. They overwinter on this branch, and then hatch in the spring into the immature caterpillar form, just as the new leaves are beginning to bud out.



caterpillar cocoon

The caterpillars then crawl up and construct their protective silken tents in which they take refuge. Some species spin their tents in the crotch of trees, and some build them in the outer branches. They feed on the leaves for about 6 weeks while they continue to develop.

At the end of this 6-week feeding frenzy, the now mature caterpillars crawl from their protective tents to a branch, a fence, or even leaf litter and spin a cocoon. It is in this cocoon that they continue to develop for about 10 days, then emerge as the adult brown moth.

It is now summer, it's time for the newly emerged adult female moth to mate and lay her eggs, and the cycle begins again!

To control an infestation, a product with the bacteria, Bt (*Bacillus thuringiensis*) or Bt-k (*Bacillus thuringiensis-kurstaki*), can safely and effectively be used if desired. This bacteria causes a paralysis of the gut of the caterpillar, thereby killing it. It is specific only for caterpillar species and is not harmful to humans, pets, honey bees, or any other organisms, and is quite safe to apply.

A Tent Caterpillar feeding episode will almost never threaten the life of a tree. The leaves of some tree species will re-bud once the caterpillars have stopped their 6-week feeding cycle. It is in a home landscape or orchard where they become a nuisance.

In a natural setting, the feeding on the leaves and subsequent nutrient-rich droppings are considered a natural pruning and fertilizing cycle. Small mammals and birds often feast on the caterpillars, and birds and bats use the adult moths for a great meal!

Jan Groth, Master Gardener
Program Coordinator

Lively, Successful Spring Plant Sale



To all of you who attended the 4th Annual Spring Plant Sale, we offer a whole-hearted “thank you!” We had 138 people attend our pre-sale Plant Talk to listen about the care and growth of numerous Arizona native and desert-adapted plants. We had countless folks attend the Plant Sale and buy collections of trees, perennials, vines, fruit trees, shrubs, succulents, and groundcovers. It was so thrilling to see all the people in line, excited to take home new plants for their gardens! We had a team of tireless Master Gardener Volunteers who worked demanding, physical, long hours to prep for this event.

To each and every one of you who helped, who shopped, who learned about gardening with our desert plants, or stopped by to say hello ... Thank you! Thank you! You helped support the Cochise County Master Gardeners' mission of educational outreach and the ongoing development and maintenance of the Discovery Gardens at UA Sierra Vista – Cochise County's botanical educational demonstration garden.

Jan Groth, Master Gardener
Program Coordinator



MG Workshop Series to begin in May

A new series of hands-on workshops called MG Workshops is being developed to present on a regular basis for not only Master Gardeners, both active and inactive, but also for all members of our community as well.

The first of the MG Workshop Series will begin in May and take place on Thursday, May 10, 2:00 PM in the Discovery Gardens Pavilion on UA Sierra Vista campus. Cal Kelley, Cochise County Master Gardener Association President, will present a hands-on workshop on pressing, drying, and processing flowers from your garden to be used in producing various forms of art such as matted pictures and greeting cards.

One process he'll teach is drying the flowers with a microwave oven, which will be on site. Materials will be available for attendees to produce their own finished products to take with them. For this first workshop, materials will be provided at no charge. There will be hand-made ceramic flower presses available for purchase.

Watch for date announcements of our 2nd MG Workshop which will take place late August-early September. It will be a multi-hour hands-on workshop on canning and preserving. Come learn what to do with those great treasures you grow in your edible gardens!

For more information, please call 520-559-7078.

*Jan Groth, Master Gardener
Program Coordinator*

Upcoming Mushroom Workshop

A Mushroom Growing Workshop is being presented at UA Sierra Vista campus on Wednesday, May 9 in the PMR of Groth Hall, 1:00 PM to 5:00 PM. The workshop is being presented by Dr. Barry Pryor, UA Tucson, School of Plant Sciences, and Thom Plasse, Cooperative Extension Instructional Specialist, Tucson Village Farm.

The growing of gourmet mushrooms is not only becoming a popular hobby, but is also becoming big new business in the agricultural industry.

Registration is required for this workshop. For complete information, please see flyer below. This sounds like a new, exciting topic!

Register at: <http://bit.ly/2F5Vw5f> or 520-626-5161

Fundamentals of Small-Scale Mushroom Production



COLLEGE OF AGRICULTURE
AND LIFE SCIENCES
COOPERATIVE EXTENSION

Presented by

Dr. Barry Pryor
Professor, School of Plant
Sciences

&

Thom Plasse
Instructional Specialist,
Pima County Cooperative
Extension, Tucson Village Farm



Gourmet mushroom production is a rapidly growing industry. Learn the basics of how to start your own operation growing *Pleurotus* *Ostreatus* (Oyster) mushrooms and other Arizona-friendly varieties.

Experience

Learn culture-transfer techniques and view a mobile mushroom fruiting chamber.

Learn

- Mushroom Biology
- Cultivation Techniques
- Troubleshooting
- Financial Inputs
- Sources of Strains and Spawn

Cultivate

Network with other growers and connect with the Arizona Mushroom Growers Association.

Registration: **\$20**
Includes Blue Oyster Mushroom grow bag for use in at-home cultivation

For more information:
azmushroomgrowers.org
tplasse@email.arizona.edu

Wednesday
May 9 2018
1:00 - 5:00 pm

University of Arizona South Campus
1140 N Colombo Ave
Sierra Vista AZ 85635

30 Spaces Available
To Register:
<http://bit.ly/2F5Vw5f>
520.626.5161

Return of the Turkey Vultures: Part 2



Photo: Cado Daily

How do Turkey Vultures fly? Occasionally Turkey Vultures flap their wings, but they predominantly soar on thermals and “teeter” holding their wings in a shallow dihedral “v” shape. Because they are so light and their wings so large, they can statically soar for long periods of time. Pilots have reported seeing Turkey Vultures soaring for hours at an altitude of 20,000 feet. In addition to soaring, Turkey Vultures can swoop up to 60 miles per hour. This flight behavior would be used to flee pursuers in the sky.

Turkey Vultures are ubiquitous and seem to be found anywhere where carrion is waiting to be consumed. Their habitats range from beaches, mountains and deserts to woods, open fields, roadsides and dumps. Many factors, predominantly the availability of food, will determine if Turkey Vultures remain in an area as year-round residents or will migrate to other locations to breed.

Migratory Turkey Vultures can fly long distances from Central and South America to southern Canada and western U.S. to breed, while in

the Northeast U.S., Turkey Vultures may migrate only short distances. Resident Turkey Vultures can be found in the southeast U.S., on the border in southeast Arizona, Mexico, Central America, and South America. Turkey Vultures have been documented flying up to 200 miles a day, but they can only fly during daytime hours because they soar on warm air thermals.

In Bisbee, AZ around mid-fall, the vultures fly south and return for the breeding season around the second week in March. Their travels may take them as far south as Panama. Only 12 miles southeast of Bisbee in Douglas, AZ, some vultures remain year-round.

The breeding of Turkey Vultures begins with a bit of a courting ritual. Before picking the perfect mate for life, the vultures check each other out on the ground and in the air. On the ground, several vultures gather in a circle (maybe a grouping of courting vultures should be called a “tease?”) and hop around the circle with partially spread wings. When courting in flight, one Turkey Vulture will lead the other through

twists and turns. Uncharacteristic outside of courtship, one bird will flap its wings in flight for as long as a minute. This pattern can be repeated for as long as three hours.

Breeding months vary. In the southern latitudes breeding begins in March and ends in June. In the northern latitudes, breeding begins later and ends in August. In the Bisbee area, migrating Turkey Vultures breed beginning in March, peaking in April and May, and ending in June.

In the next MG newsletter issue we will talk about Turkey Vulture nesting family life and behavior. If you would like more in-depth information about Turkey Vultures, there is a wonderful book recently published by Katie Fallon, *Vulture, the Unloved Bird*, available at Bisbee’s Copper Queen Library and local bookstores.

*Cado Daily, Guest Author
Water Resources Coordinator,
Water Wise Program – Retired!
University of Arizona Cochise
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Parry's penstemon



Carolina jessamine

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velopment Office, 4001 E. Foothills Drive, (Corner of Highway 92 and E. Foothill Drive) Sierra Vista.

The topic this month is *Lifestyles of Parasitic Plants*. Humans often harbor prejudice regarding parasites, but sometimes all is not as it appears to be. Parasitic plants have evolved some fascinating adaptive strategies for their lifestyle. What factors foster the evolution of parasitism? What stimulates germination and how do these plants find their host? How do parasitic plants affect community structure? Let's have a closer look at these plants to see what's going on under the surface.

The speaker will be Pinau Merlin, Naturalist, Speaker, and Author of several books, including *The Field Guide to Desert Holes*, and over 70 articles about the natural history of the desert Southwest.

This will be the last meeting until September 2018.

For more information, follow AZ Native Plant Society on their web site: <http://www.aznps.com/chapters/cochise/cochise.htm>



Mistletoe fruit



Dodder

May Reminders

- ◆ Deep water
- ◆ Plant warm season crops
- ◆ Check tree ties
- ◆ Control pests
- ◆ Control weeds

*"What is a weed?
A plant whose
virtues have never
been discovered."*

- Ralph Waldo Emerson

Cochise County Master
Gardener Newsletter Editor
Carolyn Gruenhagen