



The Virtual Gardener—*Phoradendron californicum* The Tree Thief, Part 2

As we learned last month, mistletoes grow from a seed deposited on the bark of a host tree. The primary vector for the spreading of seeds is birds that eat the berries and either ingest the seeds and deposit them in their feces or wipe the seeds from their bills as they feed. The seeds germinate almost immediately after they are deposited.

Like other seeds, the first thing to emerge from the germinating seed is a proto root called the *radicle*. In a terrestrial plant, the radicle pushes its way downward into the soil and shortly begins supplying nutrients and water to the embryo. In a terrestrial plant, the radicle is tipped by a structure known as the *root cap* that protects the end of the root as it pushes through the soil and facilitates its passage by secreting a lubricating slippery mucous.

Mistletoes also produce a radicle, but it is different than the radicle of terrestrial plants. Since there is no soft soil to push into, there is no need for a root cap. Instead, the radicle flattens out into disk-like structure known as a haustorium (from the Latin, *haurire*, meaning “to draw up” or “drink”). The haustorium is an active organ that invades the host tree and allows

the mistletoe to withdraw water and nutrients from it. This is accomplished by the chemical actions of enzymes secreted by the haustorium. Over time, the haustorium also produces shoots called “sinkers” that invade the tree and connect to the portion of its vascular structure known as the phloem. At this point the vascular systems of the mistletoe and host tree are intimately connected and function in unison.

In almost all cases, mistletoe infestations occur in older trees, mostly because birds prefer taller rather than shorter trees for roosting. Once the mistletoe germinates, it takes two to three years before the aerial shoots appear on the surface of the host and the plant begins to produce fruits. Although the mistletoe steals water, carbohydrates, and minerals from the host tree, it takes many years for it to have a major effect on the host. Over time the host will slowly decline in vigor and become more susceptible to damage from insects and pathogens.

Since birds are the primary vectors for the spread of desert mistletoe, preventing its spread is neither possible nor desirable.

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Since desert mistletoe is an important food source for so many critters, would we really want to eradicate it if we could? I think not.

The best we can do is to attempt to mitigate the problem. There are three strategies:

1. Periodically scrape or cut the aerial shoots off the tree. This will not kill the mistletoe but it will slow its growth and keep it from producing fruits and seeds.

2. Prune off infected limbs. The pruning cuts should be made at least a foot below the mistletoe and preferably at the base of the limb—good pruners don't leave "bucket-hanger" limb stubs. Of course if the infection is on the trunk of the tree this method is off the table.

3. Since birds are unlikely to infect younger trees, planting new trees near older, infected trees will insure that a replacement is present when an older tree finally succumbs. If the new trees are not host trees for desert mistletoe, even better, but realize that almost every tree is a host for some kind of mistletoe.

Before I wrap this up, I would like to mention some suggestions I have heard for dealing with mistletoe and put some misconceptions to rest. Many people seem to believe that spraying something on mistletoe will kill it. WD-40 and Black Flag insecticide have been mentioned to me as sure-fire ways of killing mistletoe. Unfortunately there is no spray-on cure for mistletoe, although 2-Chloroethylphosphonic acid (trade name Ethefon AKA Ethphon) will kill the aerial shoots, but not the plant. In effect, it is simply a substitute physical removal.

I have also been told that you must sterilize your pruning shears with chlorine bleach after every cut when removing mistletoe shoots.

There is no need to do this. Mistletoe is a plant, not a pathogen. It does not spread like a virus or fungal disease.

Here are some online resources if you would like to learn more about mistletoe.

Schmidt, R. et al. 2011. [Sinker Structure of Phoradendron californicum \(Viscaceae\) Confounds its Presumed Close Relationship to Other Acataphyllous Species](#)

A Journal of Systematic and Evolutionary Botany, Volume 29, Issue 1, Article 3

Young, D. & Olsen, M. 2011. [True Mistletoes](#), Arizona Cooperative Extension Bulletin AZ1308

Dimmit, M. 2015. [Viscaceae \(Loranthaceae\) \(mistletoe family\)](#), Arizona-Sonora Desert Museum
Until next time, happy surfing.

Gary Gruenhagen, Master Gardener
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Setting the Record Straight

I want to thank a sharp-eyed reader who caught a typo in last month's article and raised a question about the meaning of *Phoradendron*.

First, my apologies to the intrepid 19th century Army engineer and explorer Colonel James Abert and his towhee. I blindly copied "Albert's towee" from a source document I found on the web and failed to notice the spelling error, despite my word processor screaming at me with a red squiggly line under "towee." *Mea culpa*.

The translation of the genus name *Phoradendron* as "tree thief" is actually more interesting. I found the translation in a document referenced in last month's article and never questioned it—probably because it was so apt. Upon further research, I

have found a number of other documents on the web that also gave the same translation, including a comprehensive, and seemingly authoritative, dictionary of botanical and biographical etymology at Calflora.net. A little more digging, however, turned up a very comprehensive and valuable resource that I had never found before: the *CRC World Dictionary of Plant Names: Common Names, Eponyms, Synonyms, and Etymology* by Umberto Quattrocchi.

This massive work is published in four volumes and contains references for over 22,500 genera and 200,000 species. The author, Umberto Quattrocchi, is an Italian physician who has written many books and articles on plants and is a member of the Royal Horticultural Society and Botanical Society of America and a Fellow of the Linnean Society. Although the CRC books are expensive and unlikely to be found outside a university library, they have been scanned by Google Books and can be searched online.

Here is the definition it gives for *phoradendron*:

Greek *phoros* "bearing, carrying," *phero*, *phoreo* "to bear" and *Dendron* "tree": see T. Nuttall, in *Journal of the Academy of Natural Sciences of Philadelphia* 1: 185. (Aug.) 1849. pg 2048.

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May Reminders

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

This Month In the High Desert Garden

What's the Deal With Green Thumbs?

(Editor's Note: This article written by Bill Schulze was adapted from a May 2012 article published in the *Sierra Vista Herald*.)

Do you have a green thumb? Let me assure you that you definitely do. Well, at least you certainly can have one. Strictly speaking, of course, there's no such thing as a green thumb, except in a case of gangrene or carelessness during a tie-dye job. Speaking a bit less literally, though, some folks do seem to have a knack with plants while others don't, but with a little education, anybody, and I mean anybody, can grow plants successfully. Heck, I still kill the occasional plant, but I've grown a lot of great veggies, too. If I can do it, starting in my fifties, you can as well.

Think about cooking. You wouldn't expect to make good chocolate chip cookies by just dumping eggs, flour, chocolate chips, and sugar on a baking sheet and throwing it in the oven, would you? Same with plants, you need to understand the needs of the plant you're trying to grow. You can't just dig a hole, toss in a plant, and expect it to thrive.

The *Sunset Western Garden Book* will give you a basic understanding of the needs (soil type, sun exposure, water requirements) of plants. It's probably the best single gardening book you can own. It covers pretty much every plant imaginable and it tells you whether or not it will do well where you live. Most of us in Cochise County live in what *Sunset* calls Climate Zone 10. If *Sunset* says a plant will grow in Zone 10, that plant will give you a good

head start on success. If your plant isn't listed as appropriate for Zone 10, you might consider passing it by. Some nurseries have a lot of stock that isn't appropriate for our area, so study the choices you make and be sure your plants will grow well where you live. Just because you can buy an orange tree from a nursery in Sierra Vista doesn't mean you'll be spending the next thirty years drinking freshly squeezed OJ from your own tree.

The most common zone system is from the US Department of Agriculture. The USDA Plant Hardiness Zone Map defines Cochise County to be in USDA Zone 8. Zone 8 also includes most of Alabama, Mississippi, and Georgia, all with a much different overall climate than we have. The USDA zones are pretty much defined by a single parameter, that being the coldest temperatures typically experienced during the winter. The USDA divides the entire US into just 13 zones. By contrast, *Sunset* divides just the western US into 24 zones. Furthermore, the *Sunset* zones are defined by considering other climate and growing characteristics, such as rainfall, soil type, and summer high temperatures. The *Sunset* zones are very precise and useful.

Another useful planting guide is put out by the Cochise County Master Gardeners. It lists only plants that are appropriate for our climate. It's a very large list, covering grasses, ground covers, annuals, cacti, perennials, shrubs, and trees. You can find it at the following link: <http://ag.arizona.edu/cochise/mg/PlantLists.htm>. So, educate yourself and develop that green thumb you've always had.

It looks like warm weather has finally come; the leafing out of mesquite trees is a pretty reliable sign that cold weather is not a threat anymore. Go ahead and plant summer crops. It's time for tomatoes (choose varieties like Early Girl, Celebrity, Roma, or a cherry type if you are new to this), peppers (from bells to chiles—they'll all grow nicely here), melons, squash, beans, eggplant, okra, sweet potatoes, and even peanuts. Hold off on planting shrubs and trees for now; it's much better to do that once the hot dry weather is past and cooler fall weather prevails. Good selections for summer annual flowers include zinnias, sunflowers, cosmos, marigolds, impatiens, portulaca, and sweet alyssum. Try jazzing up your meals with home grown herbs. Basil, thyme, mint, chives, and oregano will all do well. Look for unusual herb varieties, which are more and more available at local nurseries. A fellow Master Gardener is growing 18—yep, 18—varieties of mint, including chocolate mint, apple mint, and orange mint, in addition to more typical ones like spearmint and peppermint.

Remember, if you need gardening help, see our website:

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

You can read the current and back issues of our monthly newsletters there and pick up a lot of great gardening tips and information; also click on the "Desert Gardening" tab for a wealth of information. Ask a Master Gardener a question via the online link or call 520-458-8278, ext. 2176.

Happy Gardening!

Bill Schulze, Master Gardener

Ready, Set... Grow!

I would like to present to you a new column for High on the Desert Cochise County Master Gardener Newsletter. "Ready, Set...

"Grow!" will act as a gateway to inform Master Gardeners and plant lovers alike of latest discoveries, timely research, and new cultivar, hybrid, or varietal releases. With the breadth of organizations, associations, and botanical gardens out there, it is often wondered what everyone is doing, and most importantly if it is pertinent to the southwest gardener.

For the first article I referred to the American Society of Horticulture Science Association to see what the latest scientists have found. Without further ado:

Research on *Fragaria ananassa* (Strawberry) performed at New Mexico State University by Shengrui Yao, Steve Guldán, Robert Flynn, and Carlos Ochoa.

Goal: To evaluate strawberry cultivars' tolerance to high-pH soil, determine the potential of strawberry yield in high-pH soil, and compare two planting systems in high elevation areas in the Southwest (a black-plastic-covered perennial system and a matted-row system).

Results: The cultivars 'Wendy', 'Brunswick', 'Honeye', and 'Clancy' were the most tolerant to high pH. 'Mesabi' and 'Kent' had the greatest yields. 'Mesabi', 'Kent', 'Cavendish', and 'Honeye' were cold hardiest. There were no differences in strawberry yield when comparing the black-plastic-covered row system versus the matted-

row system, but in 2014 the black-plastic-covered row system did show fewer yields versus the matted-row system.

Research on *Angelonia angustifolia* (Summer snapdragon) performed at Texas A&M University by Alison Bingham Jacobson, Terri W. Starman, and Leonardo Lombardini.

Goal: To determine if watering at a lower, constant substrate moisture content during greenhouse production would acclimate the plants for shipping with reduced shrinkage therefore increasing their shelf life and conserving irrigation water. Just FYI, substrate moisture content is the same as soil moisture content; however, because these are greenhouse grown they are not in soil, but instead soil-less medium (potting soil) so they term it "substrate."

Results: The snapdragons irrigated at the 20% substrate moisture content produced the best quality after arriving to retail shelves with some reduced plant height but no negative effects to flowering. This demonstrated that the same high-quality plants can be produced at lower substrate moisture content, therefore conserving water, and they have equal the shelf life as those irrigated at the 40% substrate moisture content.

I chose these two research findings because a) it is possible to produce strawberries at high pH and high elevation, and b) any research which finds conserving water as a result deserves a spotlight.

I want to try and keep this article as a quick read without too much technical information. My goal is to

simply give you the results after I read through the scientific findings. That said, the format of this article and/or organization is still in its "construction" phase, so please forgive if it looks different the next round. Hope ya'll are happily growing!

Joshua Sherman, M.A.
Commercial Horticulture Area Agent

Cuttings 'N' Clippings

✿ The Cochise County Master Gardeners have changed their monthly meeting schedule. They now meet on the **Second Thursday of the month, from 2:00—4:00 PM in the Public Meeting Room (PMR) of the University of Arizona South.** Check the web site for the next scheduled event or contact Valerie at:

valeriedavidson@email.arizona.edu

✿ The Master Gardeners have returned to the **Sierra Vista Farmers Market** on the **first Thursday of each month.**

✿ The next free Water Wise presentation will be Saturday, **May 2** from **9:00—10:30 AM** in the Public Meeting Room of Groth Hall, UASV. Toni Moore, Pima County Master Gardener will speak on **Water Gardens and Aquaponics.** Check the Water Wise 2015 schedule on their web site:

waterwise.arizona.edu

For more information contact Valerie at:

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Cochise County Master
Gardener Newsletter Editor
Carolyn Gruenhagen

Cochise County Spring Bloomers

So far, this has been a glorious spring. Sometimes it seems like we don't have spring at all when the weather goes from cold winter to windy, windy, windy then hot summer all in one week. Because of this year's gradual daytime warming, great winter rains, and cool nights, plants are having a grand time blooming and attracting all kinds of pollinators.

Because of all the flowers, this month's article will again be for identifying some of the beauties in bloom rather than focusing on one special plant (however, to me they are almost all special with one big exception mentioned below).

Chocolate flower



Do you like chocolate? When the *Berlandiera lyrata* (pronounced "BUR-lan-dee-air-ah lie-rah-tah") blooms in the morning, an intoxicating chocolate scent fills the air. Drink in this smell by tucking this excellent native wildflower near a patio where you sip your morning tea, or in a vase on the kitchen ta-

ble. Also known as "Green Eyes," find *B. lyrata* growing in well-drained soil that receives passive water harvesting (look for it at the edges of roads). It is a composite flower with yellow ray petals and dark chocolate colored disk flowers. Composite flowers (daisies are composite flowers) have two flower types in the flower head (also called an "inflorescent"): the ray flowers have long petals that surround the disk flowers found in the middle of the inflorescent. *B. lyrata* is a perennial so you can enjoy it year after year.

Desert marigold



Baileya multiradiata (pronounced "BAY-lee-ah multi-ray-dee-ah-tah"). Large stands of this very cheery bright yellow wildflower with woolly stems and leaves can be found in well draining soils. According to the USDA Plants Database, *B. multiradiata* is a perennial, biennial, or annual! There is a very similar "wannabe" desert marigold called a *Bahia absinthifolia*, Hairyseed Bahia. But look closely, the desert marigold is quite white and woolly while the *Bahia* is greener and smoother.

Penstemons

(*Penstemon species*): If you were a hummingbird, these flowers in the Plantain Family (*Plantaginaceae*) would be at the top of your restaurant list. Although there are over 500 *Penstemons* listed on the U.S. government taxonomy site (ITIS), the *P. parryi*, Parry's Beardtongue, is the most commonly seen *Penstemon* in this area with its thin green/gray leaves, large clumping habit and pink tubular flowers. *P. barbatus*, a later blooming common *Penstemon*, has longer, more persistent red flowers. These perennial *Penstemons* easily reseed forming impressive stands for a hummingbird's smorgasbord.



Antelope horns



Asclepias asperula (pronounced "ah-SKLEE-pee-us asp-er-oo-la"). This is a very cool looking milkweed plant commonly called "Antelope horns." It is low-growing with "popcorn balls" as flower heads. White to pinkish, the flowers will

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soon produce seed pods like typical milkweeds which, I suppose, look like antelope horns when mature. It likes to grow in the grasslands. A fun no-water landscape plant!

Globemallow



If you need a plant to grow where nothing else will, buy a *Sphaeralcea* (pronounced “Sfair-al-SEE- ah”) species. This mini-hollyhock wildflower grows in compacted, dry soil and thrives. I get a kick out of watching this tough native grow naturally and now find it in nurseries in shades of pinks, salmon and orange. It is great that the nursery trade makes these attractive natives accessible.

Feather dalea



Dalea formosa (pronounced “DAY-lea”) is not your garden variety shrub. Found in scrubby natural areas, this small woody shrub is covered right now in fuzzy seed heads and little purple flowers characteristic of *Daleas* now sold in nurseries. Some

Dalea shrubs are the Arizona native *D. bicolor* (Silver prairieclover), Chihuahuan Desert native *D. frutescens* (Black prairieclover), and local native *D. pulchra* (Santa Catalina prairieclover). A local native groundcover is *D. greggii* (Trailing Indigo bush). This is one of my favorite plant groups. I have the *D. bicolor*, *D. frutescens* and *D. greggii* and they grow on rocky, dry hillsides with abundant blooms that attract butterflies. My kind of no-care plant!

Fleabane



(*Erigeron species*): This small composite wildflower is happy growing just about anywhere. The perky white to light purple ray petals surround yellow disk flowers lighten up shady areas or liven up grassy spots. The flowerhead closes up at night, and gradually opens in the morning. It makes a great cut flower that has lasted for over a week in my flower vase!

Onion weed

(*Asphodelus fistulosus*): This is the “baddy” I mentioned above. It is a non-native plant that should be, if not already, on everyone’s bad list. It is a pretty



plant, but very invasive. Organizations around the state have been trying to eradicate this plant, but it just keeps appearing everywhere. It is an annual or short-lived perennial and infests areas if not controlled or removed.

Photo: John Randall, The Nature Conservancy, bugwood.org

Ocotillo



Fouquieria splendens (pronounced “foo-key-AIR-ah splen-dens”) is a succulent, but not a cactus. This wonderful plant is so much fun to watch when it puts on leaves and flowers. Normally leaf-less, when the conditions are right, it explodes in flowers and green. Excellent for landscapes, enjoy its natural growth stages, and don’t water it!

Cado Daily, M.A.
Water Resources Coordinator



Wettie sez...
BE Water Wise!



Editor’s Note: Cado Daily was honored by Sierra Vista Mayor Rick Mueller for “20 Years of Service to the City of Sierra Vista” on April 9. He said, “Her devotion to water conservation knows no bounds.” Congratulations Cado!!!