



The Virtual Gardener—Sunlight in the High Desert: Friend or Foe? Part 1

It's summertime and the gardenin' is easy. It's also the season we gardeners spend much of our time outdoors. But the abundance of sunlight that energizes our plants also poses a serious threat to us.

We perceive sunlight as "white," but it is actually a mixture of many different colors. We can see this by passing sunlight through a prism and projecting it onto a surface where it is split into a rainbow of colors, ranging from violets and blues on one end through greens and yellows to oranges and reds on the other end. Scientists tell us that light is actually a type of electromagnetic radiation (EMR) and that the colors we see represent EMR of different wavelengths. The colors at the blue end of the spectrum represent shorter wavelengths and the colors at the red end longer wavelengths. Our eyes are only sensitive to EMR in a limited range of wavelengths. But what lies beyond that range? Does sunlight contain any EMR that we can't see?

The answer is "yes," and some of what we can't see can hurt us. The longer wavelengths of EMR that lie off the red end of the spectrum—called "infrared (IR)"—are largely benign, but the shorter wavelengths that lie directly off the violet end and are beyond our visual perception—called "ultraviolet (UV)"—pose a threat. For convenience, we classify this UV radiation into three flavors—UV-A, UV-B, and UV-C.

The letters "A," "B," and "C" are used to distinguish UV radiation of different wavelengths, UV-A being the longest and UV-C the shortest. All UV-C and most UV-B are filtered out in the atmosphere and do not reach the ground. About 95% of what reaches the ground is UV-A and the rest is UV-B.

Physics tells us the shorter the wavelength of EMR, the more energy it contains. This means that UV light contains more energy than visible light. In fact it contains so much more energy that it is able to cause chemical and

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COLLEGE OF AGRICULTURE AND LIFE SCIENCES
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Cochise County

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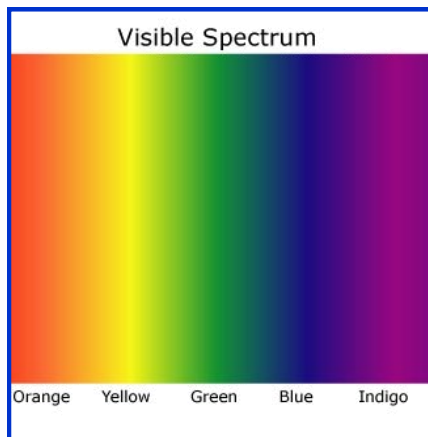
physical changes in living tissues. Some of these changes are temporary and beneficial but others are permanent and deleterious.

On the beneficial side, UV radiation stimulates the production of the pigment melanin that causes tanning of the skin. Melanin is believed to provide some protection against the damaging effects of UV radiation. Another positive benefit of UV radiation is its ability to stimulate the production of vitamin D.

On the negative side, however, UV radiation has the ability to cause permanent physical and chemical damage to the molecules inside cells, including the DNA that contains the genetic codes that control cell growth. This damage is permanent and progressive, meaning that the effects build up over time. If the mechanisms that control the growth of cells are damaged, skin cancers may develop. There are three types of skin cancers: melanoma, squamous cell carcinoma, and basal cell carcinoma. Next month we will take a closer look at these cancers.

Ultraviolet radiation is strongly attenuated in the atmosphere. As previously mentioned, UV-C is filtered out in the ozone layer in the upper atmosphere. The amount of UV-A and UV-B radiation reaching the ground depends on the thickness and condition of the atmosphere they have to penetrate to reach the ground.

The thickness of the atmosphere above the ground depends on the latitude, season, time of day, and altitude. The closer we are to the equator, the higher the sun is in the sky and the less



atmosphere sunlight has to travel through before it reaches the ground. Since we in southern Arizona are closer to the equator than more northerly locations, we get more UV than they do. When the noontime sun is higher in the sky during the summer, we get more UV than in the winter. And, of course, we get more UV in the middle hours of the day when the sun is highest in the sky. At higher altitudes sunlight also has less atmosphere to travel through than at lower altitudes allowing more UV to reach the ground. And finally, clear skies allow more UV to penetrate to the ground than cloudy ones.

We who live in the High Deserts of southern Arizona have all these factors in spades. A latitude of about 31°, altitude of nearly 5,000 feet, and average of 284 sunny days per year, gives us a UV Index that is nearly 150% higher than the national average and also gives us the dubious distinction of having the second highest skin cancer rate in the world.

Next month we will learn more about skin cancers—what their dangers are, how to recognize them, and how to protect ourselves from them.

Until next time, happy surfing!

Gary Gruenhagen, Master Gardener
virtualgardener@cox.net

Cuttings 'N' Clippings

✿ CCMGA will hold its next meeting on **Thursday, August 7** at the UASV Groth Hall Public Meeting Room at 5:00 p.m. Clinton Gray, Winnie Struse, and Bill Struse will share their experience information, their secrets, and their gardening enthusiasm with us.

✿ Water Wise presents **Saturday, August 9, Attracting Pollinators with Native Plants**. Locally native plants are THE BEST for attracting pollinators like moths, bats, bees and hummingbirds to your garden. The presenter will share experiences from her own yard where over 200 mostly low-water native plants attract 178 species of birds, 115 species of butterflies and 20 species of dragonflies. Phew!

Presenter: Karen LeMay, Cochise County Master Gardener.

Location: UASV Groth Hall Public Meeting Room at 9:00—10:30 a.m., 1140 N. Colombo Ave, Sierra Vista, AZ.

Plants will be for sale by Spadefoot Nursery after the talk.

For information call (520) 458-8278, Ext 2141, or contact Joyce at:

jwilliam@ag.arizona.edu

You can visit Water Wise at:

waterwise.arizona.edu

✿ **Saturday, August 23**
**17th Annual Water Wise/
 Master Gardener
 Xeriscape Tour**
9:00 a.m. –1:00 p.m.

Several beautiful low-water landscapes in the Sierra Vista area will be open to the public for this self-guided tour. Email

jwilliam@ag.arizona.edu

for maps and details.

Cochise County Master
 Gardener Newsletter Editor
 Carolyn Gruenhagen

This Month In The High Desert Garden— Time Is Running Out for Getting a Crop of Vegetables in the Ground

It's pretty safe to speculate that August will be a whole lot like July here in the high desert. With any luck, our monsoon rains will continue--let's hope they're gentle --and the daytime highs will be in the 80s and 90°Fs. As such, continue to plant annual flowers such as zinnia, cosmos, vincas, and marigolds, and at least some warm season vegetables. It's most likely a bit too late to plant tomato plants, although early varieties such as Early Girl, Patio, and many cherry types should still yield decently before frost strikes. If you haven't planted your peppers, chiles, winter squash, and melons by now, it would be best to hold off until next year. Beans, cucumbers, and summer squash remain good choices; there's still plenty of time to grow more zucchini than any one family can possibly eat.

Continue to give supplemental water as the monsoon rains dictate and remember to water slow and deep. A fifteen minute drip on your tree or shrub three times a week really doesn't do much good. And, with the advent of the rains, weeding becomes important. Use mulches to suppress weeds or pull the weeds by hand while they're still small. Don't give them a chance to go to seed or your weed headaches will just be multiplied in the months and years to come. Remember that if

you give a weed an inch, it'll take a yard!

When mowing grass, leave it 3-4 inches long. Cutting it too close to the ground stresses the grass, especially in hot weather. It also results in a poor looking lawn. As an alternative, think about replacing your thirsty grass lawn with a more water-use friendly landscape. It's hard to argue against spending less time mowing, or a lower water bill!

Remember that if you give a weed an inch, it'll take a yard!

Keep an eye out for insect pests. I like to use insecticidal soap or hand picking (I know, yechhh!) to control insects. I recommend buying insecticidal soap, whether pre-mixed or in concentrate form, from a nursery. Concentrate is much cheaper in the long run. If you do choose to use insecticidal soap concentrate, mix it carefully according to label instructions; there's a fine line between insecticidal soap and herbicidal soap. I nearly killed a couple of my wife's rose bushes years ago when the soap solution I made was not only made from regular dish soap, but was a bit too strong. Realize too that you must spray the soap solution directly on the insects. Soap solutions work by suffocating insects with a soap film. An insect crawling over a sprayed leaf won't be killed.

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If you're interested in getting some great ideas on planting a truly water wise landscape, the 18th Annual Water Wise/Master Gardener Xeriscape Tour will be held on Saturday, August 23, from 9:00 AM to 1:00 PM. For details (yet to be finalized), check the "Around Your Town" section of the Herald or go to the Water Wise website at <http://ag.arizona.edu/cochise/waterwise/> as the date approaches. These tours are always fun and educational; don't miss it this year!

The Cochise County Master Gardener website

<http://ag.arizona.edu/cochise/mg/> is a good resource on gardening in Cochise County. There's a link to e-mail the Master Gardeners with a question or you can call the Master Gardeners' office at 520 458-8278, X 2176. We're at the Sierra Vista Farmers Market the first Saturday of each month, so stop by and ask a question or pick up some free gardening literature. Note that the Saturday Sierra Vista Community Market is held in Veterans Memorial Park 9:00 a.m. to 1:00 p.m. during the summer.

Bill Schulze, Master Gardener

(Editor's note: This article written by Bill Schulze was adapted from an August 2011 article published in the *Sierra Vista Herald*.)

*How lovely
is the
silence of growing things!*
- Unknown

August Reminders

- ◆ Keep pulling the weeds
- ◆ Prolong annuals
- ◆ Plan your spring wildflower garden
- ◆ Watch for nutrient deficiencies, sunburn, salt burn, overwatering, & insects
- ◆ Fertilize

In a Desert Garden

Blackfoot Daisy - *Melampodium leucanthum*

This is a sweet little plant that is tough and enduring. It can take full sun, drought, and wind. The only thing that it doesn't like is standing water. In my yard, with its heavy clay soil, I planted it eight years ago on an elevated island. It is exposed to the elements, especially cold winds in winter, but every spring it is back and blooms its little heart out - just so lovely!

Blackfoot daisy has a long flowering season - from spring to almost frost. The white daisy-like flowers with the dark centers pop out and they cannot be missed even from faraway. The flowers are visited by bees and butterflies.

Don't shy away from the plant as, like most desert plants, it is not attractive in a nursery pot, but as soon as it gets into the ground it will expand and eventually will form a lovely low mound 6 - 12 inches high and 2 feet wide. I love small mounting plants. In my little yard, they look so neat. The plant is a perennial, deciduous in cold winters.

Blackfoot refers to the tiny foot-shaped bracts on the ray flowers, which turn black as the flowers ages. The name *Melampodium* comes from the Greek words melas - black and pod - foot, and *leucanthum*, leucos - white and authos - flower.

This is a great plant for a rock garden, the edging of a desert garden, or even a pot. Keep in mind it needs full sun and good drainage is important.

Angel Rutherford, Master Gardener
Photographer



NOTE from *Cado Daily*, M.A.
Water Resources Coordinator

Name changes!! I stand corrected on a couple of plants whose botanical name changes caught me off-guard when I wrote about them. Some Acacias have been renamed: *Acacia greggii* is now *Senegalia greggii*, *Acacia constricta* and *A. vernicosa* are now *Vachellia constricta* and *V. vernicosa* (the good part is that the varieties have been dropped), and our favorite Yellow Bird of Paradise is no longer a *Caesalpinia gilliesii* but a *Erythrostemon gilliesii*. A great site to get up to date names is ITIS-Integrated Taxonomic Information System.

Ask a



Cochise County Master Gardeners are available to answer your gardening questions either by telephone call to the Cooperative Extension Office or on-line on our web site at:

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

The following comes from our web site's Frequently Asked Questions:

Question: I have several cucumber, pumpkin, and squash plants that have discolored and distorted leaves. I see no insect damage and have sprayed for powdery mildew. The plants have adequate nutrition and are watered regularly. What's wrong with my plants?

Answer: Your cucurbits, (squash and melon family), have been infected with a virus. There are several different viruses that infect this family of plants. They include: cucumber mosaic virus (CVM), squash leaf curl virus (SLCV), squash mosaic virus (SQMV), watermelon mosaic virus (WMV) and zucchini yellow mosaic virus (ZYMV). Each of these pathogens usually have several strains. Sometimes an infected plant may have more than one virus causing the symptoms. Therefore, it makes an exact diag-

nosis difficult without laboratory work.

Plants will have mottled leaves, that is patches of green and yellow, often in varying hues mixed in the leaf. Whole plants and leaves are usually smaller than normal and many times deformed and fragmented. Cucumber, melon, and squash fruit are also small, stunted, and colored unusually. The fruits at times will have warts and be bumpy.

Viruses cannot survive outside of living organisms. They may be contained in the seed when planted, which occurs with SQMV. Insects serve as vectors (transmittance agents) for many viruses. Sucking insects like aphids and white flies and chewing insects such as cucumber beetles and grasshoppers transmit virus particles from infected plants to healthy ones.

Control: Some virus resistant varieties are available; their use is advisable. Control of host plants like weeds serve as stores of viruses as well as infected crop plants. Destroy these plants as soon as symptoms appear. Control insects which transmit viruses from one plant to another. I know of no chemical or natural cures for viruses in plants. The plant many times will live in a weakened state much like what happens to humans when we get a viral flu or cold.

At a Glance Box

It's a Bloomin' Cochise County Native Plant of the Month

Plant: *Jatropha*, ragged nettlespurge, *Jatropha macrorhiza*

Description: Herbaceous plant

Blooms: May-Oct. Pink cluster flowers

Use: Natural areas

Culture: Let it grow naturally

Learn more: Cochise County Herbarium,

www.cochisecountyherbarium.org

For an in-depth article, see below.

Cado Daily

Water Resources Coordinator, Water Wise Program

University of Arizona Cochise County Cooperative Extension



Mala mujer
Photos by Larry Ayers



ments from the peanut gallery please!).

Although our mystery plant does not have sharp, irritating hairs, it too is a plant worthy of respect. Many plants in the *Euphorbiaceae* family have a milky substance containing diterpenes - an inflammatory irritant that can be toxic. Interestingly, this latex substance has some scientists wondering if any of the toxins in the sap have medicinal applications.

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The Spurge Family

About this time of year, queries come in to the Master Gardener's office about a pretty, large-leafed, herbaceous plant with pink flowers that is popping up with the rains. Because it can be prolific and grows with ease, many think it a weed. But is it, and what is it?

Well, let's get the weed question out of the way. What is a weed? For me, it is an out of control plant that I can't get rid of. Like those horrible annual plants with a pretty white flower (you think, oh, what a cute flower!) but it turns into a ball of really sharp, double pronged, overly prolific black seeds that painfully stick in every thread of clothing (commonly called Spanish needles, beggar ticks or botanically *Bidens*. Bermuda grass also fits into the weed category. Grrr.

Now this plant doesn't meet either of those criteria. Yes, it grows on its own; but although there are many plants appearing right now, it really is a treat rather than an invasion. As for seeds, they are

encased in fleshy, smooth, marble-like green fruit.

Some curious observers remark that the plant looks like a castor bean (a native to tropical areas of Africa). Not to say that all plants in the same plant family have similar looking leaves or seed pods (plants are primarily classified by flower parts), but the castor bean plant and this plant are in the same family - *Euphorbiaceae*, the Spurge family.

A similar local plant that resembles this mystery plant is also in the *Euphorbiaceae* family and, like the toxic castor bean plant, is a plant that demands respect. The common name of this sister plant, is "Mala mujer" or Bad woman (lousy common name if I can insert an editorial comment). The *Cnidocolus angustidens* is really a fascinating plant that has developed an amazing defense system. The palmate leaves have white spots on them, but at closer inspection, each spot has a sharp spine or hair with a milky substance at its base. Yowza. Don't mess with that plant (no com-

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Our mystery plant has pretty, delicate pink flowers in cymes clustered at the top or sides of the plant, and large palmate leaves. It grows to about a foot or so high and wide, and is seasonally perennial with a fleshy, thick root. It dies back in the dry and cold weather but sprouts in early summer just where you forgot it was last year.

It is a pretty addition to a monsoon garden, but if you have munching domestic animals where it grows, you would want to either keep your animals away from it, or eradicate it from the area where the animals are.

I would be surprised if it could be purchased because of its toxicity, but then again Poinsettias, also in the *Euphorbiaceae* family, have become so popular that it is a signature Christmas plant! (Just don't eat it!)

I do wonder though, what function the plant plays in our local landscapes. It is a local native, found growing on flat lands between 3,599 to 7,500 feet in elevation and looks pretty well settled in to the area, but not invasive. A member of the same genus, *Jatropha curcas* has seeds that have produced a biodiesel fuel. Humm!

Oh, what is this Bloomin' Cochise County plant? It is the *Jatropha* (jah-TROE-fa), *Jatropha macrorhiza* (macro-rhiza meaning big root). It is also known as the ragged nettlespurge, but I think *Jatropha* sounds much more worthy of this unique plant – don't you?

Cado Daily, M.A.
Water Resources Coordinator

Don't miss the *Water Wise* and Cochise County Master Gardeners

17th Annual *Xeriscape Tour*



Saturday, August 23

10 a.m. to 1 p.m.

Beautiful low water landscapes in the Sierra Vista area will be open to the public for this self-guided tour. Cochise County Master Gardeners will be at the sites to answer questions and point out the features of each landscape.

For a map to this free tour, call the Cooperative Extension office at 458-8278 x 2141 or email jwilliam@ag.arizona.edu



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Jatropha macrorhiza

