



High on the Desert Cochise County Master Gardener Newsletter

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The University of Arizona and U.S. Department of Agriculture Cooperating

The Virtual Gardener—How Much Water is Enough

A couple of years ago the Master Gardeners began a study to find out how much water desert-adapted plants really need to survive and thrive. This month I will give you the results of the study, such as they are.

In October of 2005 Master Gardeners installed a total of 75 plants in three different beds in the Plant Sciences Center on the University of Arizona South campus. Fifteen plants, representing each of five different species (*Leucophyllum sp.*, *Rhus sp.*, *Senna sp.*, *Salvia greggii*, and *Vauquelinia californica*) were divided into groups of five, randomly placed into locations in beds filled with loamy soil and mulched with two inches of compost.

The plants were allowed to establish for six months and then placed on prescribed drip irrigation watering schedules. In the first bed the plants each received four gallons of water every 7 days; in the second bed they received the same amount of water every 14 days; and in the third bed they received the same amount of water every 21 days.

Beginning in September 2006 and continuing on a monthly basis during the active growing season, the plants were visually evaluated by Master Gardeners for overall appearance. The heights and widths of all the plants were measured at four different times from July 2006 to October 2007. In October 2007 all plants were cut off at ground level, the cuttings dried for two weeks, and the dried cuttings weighed.

The appearance ratings and measurements were analyzed to determine if there were any statistically significant differences between the plants in the different beds. Surprisingly, no differences were found in most cases. This indicates that four gallons of water delivered every three weeks to each of these plants, together with the amount of water received from precipitation, was more than adequate to allow them to survive and thrive.

If you are growing any of these plants and providing them with more than about four gallons of water a

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month, consider reducing the amount of water, adding organic matter to the soil to improve moisture retention, and mulching them heavily. Your plants will look great and you will save money on water.

In the meantime, checkout the *WaterWise* Web site at http://cals.arizona.edu/cochise/waterwise/sierra_vista_plant_list.pdf for tips on how much to water your plants.

The Master Gardeners are planning a follow-on experiment to further refine these results—stay tuned.

Until next time, happy surfing.

Gary A. Gruenhagen, Master Gardener
virtualgardener@cox.net

High on the Desert

High Desert Gardening & Landscaping Conference Scholarship Application

The Cochise County Master Gardeners Association (CCMGA) is awarding up to three full scholarships to the 2009 High Desert Gardening & Landscaping Conference to be held at the Windemere Hotel & Conference Center, Sierra Vista, AZ, February 12 & 13, 2009. Applicants are invited to submit an essay on one of the following topics:

- **Gardening for food production**
- **Landscaping with native plants**
- **Environmental stewardship**

Essays must meet the following criteria:

1. 750 to 1,000 words in length.
2. Double spaced and typed on plain bond paper — a disk or CD included.
3. Represent original scholarship and be suitable for publication. All references and authorities cited must be properly attributed.
4. Entries must be accompanied by an official cover sheet available from the Cooperative Extension Office at the University of Arizona South campus or from the Master Gardener web site.
5. Entries must be received at the Cooperative Extension Office, 1140 N. Colombo, Sierra Vista, AZ 85635 not later than close of business on January 16, 2009.

Entries will be judged by the Cochise County Horticultural Extension Agent and a committee of Master Gardeners appointed by the President of CCMGA. The awardees will be notified not later than January 30, 2009 and their names published in the February 2009 Master Gardener Newsletter.

Cuttings 'N' Clippings

* The next CCMGA meeting is 5:00 p.m. Thursday, December 4 at the University of Arizona South Campus Public Meeting Room. Master Gardener, Gary Gruenhagen, will be discussing the Plant Science Center watering project discussed above.

* There will not be a *WaterWise* workshop in December.

* The 16th High Desert Gardening & Landscaping Conference will be held at the Windemere Hotel & Conference Center on February 12 & 13, 2009. Mark your calendar now and plan to attend this educational experience. Scholarships are available—see details above.

Happy Holidays



Introduction to Entomology: Arizona Master Gardener Manual

Insects belong to the kingdom Animalia. The Animal Kingdom contains many distinct groups called phyla. Each phylum is divided into a number of classes. Insects belong to the class Insecta in the phylum Arthropoda (“jointed foot”). The insect class is further divided into orders, families, genera, and finally, species. A related class in the phylum Arthropoda is the class Arachnida, the scorpions and spiders. Approximately 1 million species of insects have been identified to date and probably more than 1.3 million different species exist. The greatest numbers of these species belong to the beetle order (Coleoptera), fly order (Diptera) and the wasp-bee-ant order (Hymenoptera).

Insects are, except for a few common structural features, quite different from one another. Size is one factor that varies considerably, ranging from microscopic wasps that are less than a millimeter in length, to some of the long-horned beetles (such as the palo verde borer) which may be as much as six inches long. Some insects have horns and spines which render them rather bizarre, while others may resemble a dead leaf or a stick. Some insects are quite attractive, and have been used as jewelry or in art.

All of this variability makes the insects a fascinating group to investigate, but it also makes the study of insects and their classification somewhat complex. It is important to learn the main differences between insect groups so that we can distinguish one from another. You must know about insects to be able to suggest adequate control procedures and give quality management suggestions.

Source: ag.arizona.edu/pubs/garden/mg

Garden Tip 4086

Empty 2-liter soda bottles can be a gardener’s best friend. With a minimum amount of work they can be transformed into all sorts of useful garden implements. This week as I was pulling stickers out of my fingers and massaging an aching back after a day of weeding around my ornamentals, I came up with yet another use.

I would have liked to use an herbicide in the planting beds but was afraid of inadvertently spraying my ornamentals as well as the weeds, and some of the herbicides can be deadly in even tiny amounts. What to do?

An empty 2-liter soda bottle was the answer to the problem. Here’s how to use it:

1. Cut the bottom off the bottle with a sharp knife. (A razor blade, box cutter, or Xacto knife work well; just be careful!).

2. Obtain a small hand-pumped spray bottle of the kind frequently sold in garden shops, remove the screw-on spray nozzle, and measure the diameter of the threaded portion that it attaches to. (Mine was ½ inch.)

3. Remove the cap from the soda bottle and drill a hole of the same diameter in the center of the cap.

4. Slip the cap (threaded side out) over the threaded portion of the sprayer and reattach the sprayer nozzle to the bottle.

5. Screw the soda bottle onto its cap to create a spray shield around the sprayer nozzle.

You can now place the spray shield around a weed and dowse it with herbicide without worrying about spray drifting onto your ornamentals.

Gary A. Gruenhagen, Master Gardener



Robert E. Call

Robert E. Call
Extension Agent, Horticulture

Carolyn Gruenhagen
Editor

Did you know . . .

The Cochise County Master Gardener Newsletter, *High on the Desert*, just completed its 19th year of publication!

Cacti 101: Chapter 3—Engelmann’s Prickly Pear

In Chapter 2 we discussed the spines and glochids we find on opuntia. The point of that discussion, no pun intended, was the potential for pain and inconvenience associated with careless handling of opuntia. In fact both traditional spines and glochids we were concerned about then are actually modified leaves, not thorns. Some cacti have only long sharp needle like spines. Others have clusters of short hair like spines called glochids. Many opuntias carry both types of spines or leaves making them among the most unpleasant cacti to encounter. No matter what type of spine or leaf we find on cacti they all originate from areoles, a highly specialized bud on the cacti pad. In our discussion of propagation in Chapter 1 we suggested planting a pad at least one third to one half below ground. This was to ensure many areoles are buried since they generate roots when covered with soil.

Almost every cactus grower or admirer thinks he or she knows *Opuntia engelmannii* or Engelmann’s Prickly Pear. So did the author until he started researching this Cochise County native cactus. It didn’t take long



Figure 1

Opuntia engelmannii (*O. engelmannii*)

to discover there are at least six recognized varieties of this cactus. The variety we probably know best, and the most widespread, is *O. engelmannii* var. *engelmannii*. (See Figure 1.) This variety goes by a number of common names including Engelmann’s Prickly Pear, Desert Prickly Pear, and Cactus Apple. Here we see the problem of relying on common names. Five of the six varieties of this cactus are often called Cactus Apple and at least two are called Engelmann’s Prickly Pear.

O. engelmannii occur widely from Arizona to Louisiana and well south in Mexico. They grow in sprawling clumps to over ten feet high and wide. In most varieties the stem segments are roundish with both traditional spines and glochids. (See Figure 2.) Traditional spines can be as long as two inches



Figure 2

making these large cacti unsuitable for growing near walkways, paths, or driveways. Flowers are usually yellow or sometimes reddish. Fruit is purple and fleshy usually 1 to 3 inches long. An exception to the round pads occurs in *O. engelmannii* var. *linguiformis*. In this variety the pads are long ovals often with narrow ends. This pad shape is responsible for its common name, Cows Tongue Cactus. (See Figure 3.)



Figure 3

Texas named the Prickly Pear the state plant in 1995. One recognized variety, *O. engelmannii* var. *lendheimeri*, is called the Texas Prickly Pear. Spines are often absent on the bottom portion of each pad of the Texas Prickly Pear. Other varieties include *O. engelmannii* var. *cuija* native to Mexico, *O. engelmannii* var. *flavispina* native to Arizona and *O. engelmannii* var. *flexospina* native to Texas and Mexico.

Like many cacti, *O. engelmannii* has been used by Native Americans medicinally. The Pima used heated stem segments to treat newly pregnant women. However, these cacti can also become a pest. They may become a problem weed in plowed fields.

Doug Templeman, Master Gardener

On being generous when sowing seeds:

**“One for the rook;
One for the crow.
One to die and
One to grow.”**

*-Old Wives’ Lore for Gardeners
Copyright 1976*

Call's Classic Comments

Wives Tales and Snake Oils, Cont'd

Myth #4: Pesticides are toxic and harmful. Of course they are harmful—they are meant to destroy pests. *Webster's New Colligate Dictionary, 1980*, defines a pesticide as, "An agent used to destroy something that pesters or annoys." What are some of these pests that we as gardeners are concerned about. There are insects, bacteria, fungi, viruses, mycoplasmas, weeds, rodents, mammals, and nematodes that are trying to make a living the best they can. When they make their living at our expense we try to limit the damage they cause. Generally people suffer from a condition known as "chemophobia." *Call's Dictionary, 1995*, defines chemophobia as "the unreasonable fear of chemicals." People are usually afraid of things they do not understand or have knowledge about. The whole earth and its populating organisms, the solar system, and universe are made up of 92 chemical building blocks found in the chemical periodic table. Some of the most toxic compounds are produced by Mother Nature. The venom of a sea snake found off the coast of South America is the most toxic of all chemical compounds known to man. Several milliliters of botulin toxin could kill the entire human race. Pesticides that are used to produce food are necessary to feed a hungry world.

One measure of toxicity given to compounds, however not the only one, is the LD₅₀ rating. This is the Lethal Dose of the compound in question needed to kill 50% of a test population, usually lab mice or rats. The LD₅₀ is calculated from animal experiments and is stated as the number of milligrams of the compound per kilogram of body weight needed to produce 50% mortality. The lower the number, the more toxic the compound. These numbers are developed so relative toxicities can be compared. Below is a list of some pesticides ("organic" and conventional) and common household products and their respective LD₅₀'s:

RoundUp®—5,000
 caffeine—192
 coffee—80 to 175
 malathion—1,500
 pyrethrin—1,500
 rotenone—1322 to 1,500
 diazinon—1,250
 Sevin—246
 bleach (10%)—11 to 33
 ammonium—132
 aspirin—1,000
 salt—3,000
 cyanide—2.80

Source: Pesticide Coordinator's Office, UA Poison Control Center, Tucson, AZ

It is interesting to see that many commonly used household products have much higher toxicity levels than pesticides. Remember that the lower the number the more toxic. Also, the so called "organic" pesticides have LD₅₀'s

that are equal to conventional pesticides. Just because something has an "organic" label does not mean that it is not toxic and should be spread around with wild abandon! Always read and follow the label that comes with pesticides. It is a legal document and if not followed, you break the law. It is interesting to note that coffee is more than 28 times more toxic than RoundUp® herbicide to mammals in terms of LD₅₀'s: So, just because something is natural or manmade does not mean it is benign or harmful.

Myth #5: Wives' tales are information passed down from generation to generation with a grain of truth. There are many wives' tales that at one time might have contained some truth but over time become so distorted that they are pure fiction. I'm sure that everyone can think of a wives' tale. My thought is why are there no husband tales?! I placed a request on the Internet to receive some wives' tales from different parts of the country. Here are two of the better responses that I received.

1. There is an important feature about sowing parsley. It has to be sown by the head of the household or it is very unlikely to grow at all. So, get out and put it in the ground before your husband gets up! Not that there could be any dispute on this point, but better be on the safe side.

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Cochise County Master Gardeners Association in conjunction with
The University of Arizona Cooperative Extension presents . . .



Registration forms
available in January!

the 16th annual
**High Desert Gardening &
Landscaping Conference**

High on the Desert

February 12 & 13, 2009
Windemere Hotel & Conference Center
Sierra Vista, AZ

An educational experience for everyone with an interest in gardening. For information contact
U of A Cooperative Extension - 1140 N. Colombo - Sierra Vista, AZ (520) 458-8278, Ext. 2141
www.ag.arizona.edu/cochise/mg/ - Registration and fee required for conference -

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2. From Virginia, "I recently gave a new neighbor in rural Virginia some camellias, but she said she could not thank me. If thanks is expressed for a gift plant, the plant will die."

Myth 6: Snake oils are materials that are supposed to enhance plant growth or control pests. Many products are marketed or are traditional remedies that are said to have value. When placed under scientific scrutiny, little if any response is observed. Granted there are things that cannot be measured scientifically, however when products claim to produce growth responses they should be measurable. One product that has been tested is the root stimulator B1. When tested against other compounds it turned out that the small amount of fertilizer in some B1 preparations is what produces the growth response.

B1 in and of itself was not better than water in producing growth response. This research has been conducted at the University of Arizona by Dr. Jimmy Tipton and Elizabeth Davison.

Myth #7: Gardening is hard work. It turns out that more work is done in the garden harvesting than all other activities combined. Time harvesting, in relationship to other gardening activities, increases as the size of the garden increases. This from work done by Dr. Michael Stevens and other researchers at Brigham Young Uni-



versity. They timed the various activities of planting, weeding, harvesting, and miscellaneous work in 4x4, 10x10, 20x20, and 50x50 foot gardens throughout a growing season. The time spent harvesting is more enjoyable and passes more quickly than the work of preparing for planting, weeding, and other activities. They also found that the 4x4, 10x10, 20x20, and 50x50 foot gardens yielded 8.06, 7.22, 10.12, and 22.75 pounds respectively, of produce per hour of total time spent in the gardens.

Robert E. Call
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(Note: Originally given as a presentation to the Southwestern Low Desert Landscaping and Gardening Conference in Phoenix in August 1995. Reprinted from the December 1995 and January 1996 Cochise County Master Gardener Newsletter. The Agent's Observation column returns next month.)