



High on the Desert Cochise County Master Gardener Newsletter

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

Garden Basics: Introduction to Gardening in Cochise County and Ft. Huachuca

Local Climate

- Cochise County receives an average of 15" of rainfall a year, occurring mainly during the months of July-September.
- Average annual snowfall is 7".
- Humidity is generally very low (less than 15%).
- Average daily maximum temperature ranges from 58.7°F in January to 90.7°F in June.
- Due to the area's higher elevation and dry climate, there will typically be 25-30°F variation between the daytime high and evening low.

What does this information mean to you?

Due to the limited rainfall our native soils are **alkaline**. The relative acidity or alkalinity of soils is expressed as pH, which is a measure of the relative number of free hydrogen ions. The pH scale goes from 1 through 14, with 1 being the most acid and 14 being most alkaline, and 7 being neutral. Each number represents a tenfold change in acidity or alkalinity. For example, a soil with the pH of 9 is ten times more alkaline than one with a pH of 8. Generally, soils are acidic where it receives more than 20 inches of rainfall in a

year. In areas with less than 20 inches of rainfall per year, such as the lower elevations of Cochise County, the soils are alkaline. This is due to the calcium carbonate that is not leached through the soil because of our limited rainfall. In addition, Arizona soils contain very low levels of **nitrogen** (a *macronutrient* needed by plants in order to thrive) and **organic matter** (the remains of plants and animals).

This is why you want to garden with native and adapted plants!

From the gardener's perspective, the best reason for landscaping with native and non-native adapted plants is that they require much less care and maintenance than most exotics. *Adapted* plants are plants found in other parts of the world that have similar climate conditions. A *native* plant is a plant native to the southwestern United States and northern Mexico. Most of the non-native plants that people attempt to grow are just not adapted to our soils and climate. Plants that are not accustomed to high temperatures, low humidity, and alkaline soils struggle in our climate. This means that the gardener is constantly fighting with nature to keep the

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plants alive. Native plants have chosen this area to grow in because they like the local environment. They thrive in alkaline soils and have developed mechanisms to deal with the heat and dryness.

Now that you know our native soils are alkaline and lacking in organic matter, how can you use this information?

Although our soils are lacking in organic matter, when planting native and adapted plants, you generally do not need to add soil amendments such as manure, fertilizer and compost. Adding organic material changes the soil structure from the surrounding native soil. Research shows that roots within a planting hole where organic material has been added will circle around within the hole rather than venture out into the surrounding soil. Organic material is best used as mulch on top of the soil around plants. Mulch will help to conserve moisture, moderate soil temperature, reduce weeds and, over time, provide nutrients to the plant, such as nitrogen.

When should you add organic material to the soil?

To improve the soil for specific reasons, such as adding compost to the vegetable garden, annual and herb beds, roses and other exotics, or to improve drainage in a manageable area (such as the root zone around small trees and shrubs).

Most common problems related to soils:

Iron Chlorosis (Iron Deficiency) - The high pH of our soils changes iron from a form that plants can use (ferrous) to one that is unavailable to plants (ferric). Iron deficiency causes leaves to lose their green color, starting at the outer edges of the leaf and



progressing inward. Leaf veins usually remain green. The newest leaves, located at stem tips, are the most affected.

Management: Apply chelated iron according to the directions on the product label.

Nitrogen Deficiency - During times of active plant growth, native soils may not be able to supply sufficient nitrogen. (Fortunately, many of our native plants have the ability to “fix” their own nitrogen!) Plant growth is slow and plants are spindly. Older, lower leaves are affected first and turn yellow. Leaves may drop off or remain on the plant.

Management: Use a fertilizer containing nitrogen, according to the directions on the label.

Soil too Alkaline - Plants growing in soils too alkaline for their needs may develop yellow areas between the veins on the newest leaves.

Management: Avoid planting acid loving plants such as rhododendron, azaleas, hydrangeas, etc. Soil pH can be corrected by adding soil amendments, but this can be expensive and time-consuming as it must be done at consistent intervals throughout the entire life of the plant. Acid loving plants may be grown in containers where their needs can be easily met in a controlled environment.

Salt Damage - Limited rainfall contributes to an accumulation of salt in soils as 30" of rainfall per year is needed to leach salt through the soil and away from plant roots. Salt can

also accumulate due to the application of fertilizers (especially manure) and shallow irrigation (watering). Leaves turn brown and look somewhat “burned” due to the deposit of salt in the leaf tips and margins. Leaves drop and plant growth slows down. A white crust may be visible on the soil surface or on the outside of clay pots in which plants have been planted.

Management: Deep irrigation is necessary to flush the salt beyond the root zone. Potted plants can be immersed in a bucket or tub of water to leach out salts.

Hardpan or Caliche - A soil layer that allows very little water to pass through. In desert soils it is usually caused by a caliche layer in which the soil particles have been cemented together by minerals. Water retained in the shallow soil layer above the hardpan quickly evaporates, causing the plant to wilt in hot dry weather. Adding more water to the plant may drown the roots, killing the plant.

Management: Avoid planting in a hardpan area. An option is to dig drainage chimneys (see *Cooperative Extension Planting Guidelines: Container Trees and Shrubs*, form AZ1022).

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The Virtual Gardener—The AgData Portal

Other problems related to soils - See the *Sunset Western Garden Problem Solver*, or the *Cochise County Master Gardeners Manual*.

NOTE: If Texas Root Rot is suspected, it can only be diagnosed by examination of the root hairs under a microscope. Very often, over watering can mimic the symptoms of Texas Root Rot. Bring pencil-sized roots in to the Cooperative Extension office for diagnosis.

Ginger Maxey, Water & Energy Conservation Educator, and Cheri Melton, Plant & Landscape Technician from the Water Wise and Energy Smart Program, Ft. Huachuca, both Cochise County Master Gardeners



Cuttings 'N' Clippings

* The next regular meeting of Cochise County Master Gardeners is November 7, 5:00 p.m. at the Sierra Vista Library. Guest speaker will be Rick Koehler and there will also be a presentation from the participants to the Master Gardener University in August. On October 27 a CCMGA tour is scheduled. CCMGA members are asked to contact the Sierra Vista Cooperative Extension Office for details.

I must begin this month's column with an apology. There was a typo in the URL I gave for the Garden Portal site last month. The correct URL is

<http://ag.arizona.edu/gardening>
Hopefully the mistake didn't cause you any major inconvenience.

As promised, this month I will discuss the second of the Portal sites I learned about at the Master Gardener University in August. This one is being developed by Robert MacArthur, another Web wizard at the University of Arizona College of Agriculture. It is called the AgData Portal and can be found at

<http://ag.arizona.edu/agnet/agdata/>

Like the Garden Portal, the AgData Portal is a work in progress. In fact a portal site, by definition, can never be finished since its purpose is to provide links to the latest and greatest Web sites and the latest and greatest is always changing. As its name suggests, the AgData Portal focuses more on data than does the Garden Portal, although there is some overlap. Not counting administrative topics, the AgData Portal is organized into six major topic areas: Weather, Watershed, Plants, Insects, Natural Resources, and Related Projects. Three of these—Watershed, Insects, and Natural Resources—currently have no content...or at least they didn't as of this writing.

The Weather page has links to the AZMET Customized Data Generator, the Arizona Storms Database, and Arizona Weather History. If you are a weather buff, these sites are a gold mine of information. The AZMET Customized Data Generator allows you to access hourly,

daily, weekly, or monthly data from AZMET stations around the state. The Bonita AZMET station is the one of interest to residents of Cochise County. Bonita is about 25 crow-flying miles north of Willcox and lies at an altitude of 4400 feet above sea level.

Data available from the AZMET sites include: date/time; min, max, and average air temperature; min, max, and average relative humidity; soil temperatures at 2 and 4 inches below the surface; min and average wind speed; solar insolation; rainfall; evapotranspiration; and 45, 50, and 55 degrees Fahrenheit heat units. If you are interested in scientifically determining when

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October Reminders

- ◆ Be ready for the first frost
- ◆ Thin the seedlings
- ◆ Overseed lawns
- ◆ Plant spring bulbs
- ◆ Divide perennials
- ◆ Don't let the weeds go to seed

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to water your plants, you can't do any better than using the AZMET data.

Data from AZMET sites are available in HTML (which means you can see it on your Web browser) and database friendly text files in both comma- and tab-delimited formats. Unfortunately, I could not get the text files to download properly using the AZMET Customized Data Generator, although I have successfully downloaded data in these formats from AZMET in the past.

If you are interested in Arizona weather statistics, the Arizona Storms Database and Arizona Weather History sites are for you. The Storms database can help you settle that argument with your spouse about the great storm of ... For example the great snow storm of 1978 when temperatures in Arizona dropped to -30° F and the snow closed I10 occurred on 69 December. The Weather History database will give you monthly averages for precipitation and max and min temperatures for communities all over Arizona for as long as data has been recorded there.

The Plants page of the AgData Portal includes links to the Arizona Plant and Horticultural Images Database which currently only has 52 images of plants. In addition to plant pictures, the site also includes the scientific and common names of each plant and a brief description of the plant. This site is obviously in its infancy but holds plenty of promise for the future. You can even contribute to it.

Other links from the Plant page include BotanyWorld which allows you to identify plants using an

online key. Unfortunately I could not get the key to work for me. Similarly there is a link to a database of Medicinal and Edible Plants which includes a search engine that allows you to search for plants by name or medicinal effect as well as instructions on collecting, drying, and preparing medicinal plants. Again, I am sorry to report I could not get the search function to work for me.

The Plants page includes several other links worth exploring. One of the links I found most interesting was the Arizona Crop Information link. This page is primarily oriented on commercial growers but includes a link to the online version to a classic book published by the University of Arizona, *An Illustrated Guide to Arizona Weeds* by Kittie Parker. This book not only provides line drawings of a huge number of weeds that grow in Arizona but a good narrative description of each weed as well.

There are many other links to be explored from the AgData Portal, but I will leave that as an exercise for the reader. Although much of the site is still under construction, I would urge you to add it to your "Favorites" list and visit it often to see what's new.

Until next time, happy surfing!

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Upcoming Events

◆Fall Garden Sales◆

Tohono Chul Park
7366 N Paseo del Norte, Tucson
(520) 884-8806
October 6-7

Tucson Botanical Gardens
2150 N Alvernon, Tucson
(520) 326-9686
October 6-7

Diamond JK Nursery
S. Hwy 83, Sonoita
(next to Eagle Milling Feed Store)
(520) 455-9262
October 9-13 (15% off)

Boyce Thompson Arboretum
37615 U.S. 60, Superior
(520) 689-2723
October 12-28

Tucson Botanical Gardens
Chili Festival
October 27-28

◆**Rainwater Harvesting Tour**◆
Sunday, October 21, 2 to 6 p.m.
Don't miss this guided tour of several Tucson homes that have implemented innovative ways of harvesting and utilizing the seasonal rainfall. Each site offers other alternative features of interest, as well. Call Women Builders at 206-8000 to register for this co-ed event.

◆**Water Wise Workshop**◆
The November 3 workshop is *Toilets, Drips, & Tricks* presented by Struse Plumbing. The free workshop takes place at the U of A South Campus from 9—10 a.m.



The Agent's Observations

Q I was told that common garden insecticides will no longer be available next year. Is this true and if so when will it happen?

A On June 8, 2000, EPA announced an agreement with chlorpyrifos maker Dow Agro Sciences regarding the products Lorsban and Dursban, and myriad household products under different names, to phase out use. By 2005, indoor and outdoor uses will be limited to specific sites where there is no risk of exposure for children. Home owners will not be able to purchase chlorpyrifos after December 31, 2001. However, certified applicators will be able to purchase and apply this product.

On December 5, 2000, EPA announced a similar agreement with the six diazinon registrants. They agreed to the voluntary removal of diazinon from a number of agricultural uses. They also agreed not to sell products to homeowners after December 31, 2002.

In 1996, Congress unanimously passed The Food Quality Protection Act (FQPA). This landmark pesticide food safety legislation was supported by the Administration and a broad coalition of environmental, public health, agricultural and industry groups. President Clinton promptly signed the bill on August 3, 1996, and the Food Quality Protection Act of 1996 became law (P.L. 104-170, formerly

known as H.R. 1627). FQPA replaced the Delaney Clause, enforced by the Food and Drug Administration (FDA), which mandated that all processed foods have zero pesticide residues.

EPA regulates pesticides under two major federal statutes. Under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), EPA registers pesticides for use in the United States and prescribes labeling and other regulatory requirements to prevent unreasonable adverse effects on health or the environment. Under the Federal Food, Drug, and Cosmetic Act (FFDCA), EPA establishes tolerances (maximum legally permissible levels) for pesticide residues in food. Tolerances are enforced by the Department of Health and Human Services/Food and Drug Administration (HHS/FDA) for most foods, U.S. Department of Agriculture/Food Safety and Inspection Service (USDA/FSIS) for meat, poultry, and some egg products and the U.S. Department of Agriculture/Office of Pest Management Policy.

For over two decades there have been efforts to update and resolve inconsistencies in the two major pesticide statutes, but consensus on necessary reforms remained elusive. The 1996 law represents a major breakthrough, amending both major pesticide laws to establish a more consistent, protective regulatory scheme, grounded in sound science. It mandates a single,

health-based standard for all pesticides in all foods; provides special protections for infants and children; expedites approval of safer pesticides; creates incentives for the development and maintenance of effective crop protection tools for American farmers; and requires periodic re-evaluation of pesticide registrations and tolerances to ensure that the scientific data supporting pesticide registrations will remain up to date in the future.

The EPA has been reassessing tolerances in connection with its ongoing re-registration review of chemicals first registered before November, 1984. Pesticides approved after that were not subject to re-registration requirements. While transitional provisions maintain existing tolerances in place upon enactment, the new law requires review of all tolerances on the following schedule: 33% within 3 years; 66% within 6 years; and 100% within 10 years. Priority will be given to pesticides that may pose the greatest risk to public health. The EPA review is currently several years behind schedule.

All tolerances will be required to meet the new safety standards, which should increase assurance that they are protective of all American consumers, including infants and children. The magnitude of this task is considerable; well over 9000 tolerances are

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currently in place. EPA will coordinate review schedules under FFDCA and FIFRA to the maximum extent possible.

All classes of chemical uses were estimated for an individual life-long exposure. This includes household cleansers, pet pest control products, industrial and agricultural chemicals among others. The normal life time use rate of all these chemicals are placed in a "risk cup." When the cup is full this is all the exposure humans are allowed to have over a life time. Infants and children have smaller risk due to body size, metabolism, developmental processes and other factors.

Source: www.epa.gov/ and The U of A- Acces-Pesticides, Vol. XXVI, Num. 3, page 1.

Cool Season Crops

Many of the cool-season crops, those that can withstand freezing, do very well in Cochise County during the fall. In fact, the fall in Cochise County is better generally than the spring to raise cool-season crops. These vegetables include the cabbage family, *i.e.* broccoli, cauliflower, kale, and cabbage among others. Also, spinach, small beets, peas, both snap and edible pod, turnips, radishes, lettuce, mustard greens, and other greens do well. The onion family does best when planted in the fall and then over wintered and harvested in early summer. Other members include garlic, onions, and chives.

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THANKS!

A big "thank you" to all of the vendors, volunteers, and the public for making the High Desert Garden Fair successful! Hats off to Helen Sisney for chairing the fair this year. Also, thank you to the homeowners who opened their gardens to the public for the Fall Xeriscape Garden Tour!