High on the Desert Cochise County Master Gardener Newsletter

Vol. 29, No. 2 February 2018

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

The Virtual Gardener — Arizona's Climate Variability

On Saturday, January 13, Dr. Michael Crimmins and I shared the stage at a Water Wise workshop at the University of Arizona South to talk about Arizona weather and climate. I gave a talk on the volunteer rainfall reporting system of the University of Arizona called RainLog (see my **article** in the September 2017 issue of the Cochise County Master Gardener Newsletter for information about the RainLog program) and the local variability of rainfall. Dr. Crimmins, a climatologist with the Cooperative Extension of the University of Arizona, talked about the variability of weather and climate statewide and over time. This month I would like to share with you some of the things Crimmins discussed.

Dr. Crimmins began his presentation with maps showing the variability of rainfall and temperatures across the state and across time. Three factors play important roles in this variability: topography, seasonal wind shifts, and latitude.

The most notable topographic feature of Arizona is the huge escarpment called the Mogollon Rim that cuts diagonally across the state from northwest to southeast. The "Rim" is the dividing line between the high elevations of Colorado Plateau and Arizona Highlands to the east and the lower elevation broken topography of the Basin and Range deserts to the west. The abrupt change in elevation at the Rim has a profound effect on our weather and climate.

Temperatures tend to be strongly controlled by elevation, so the high elevations of the Rim and areas to the north and east have lower annual temperatures while the low deserts to the south and west are much warmer.

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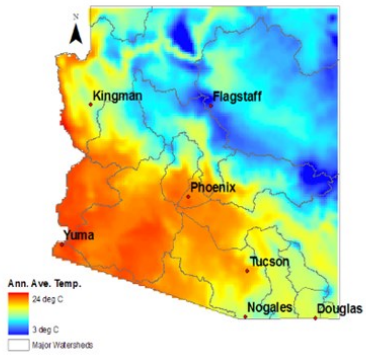
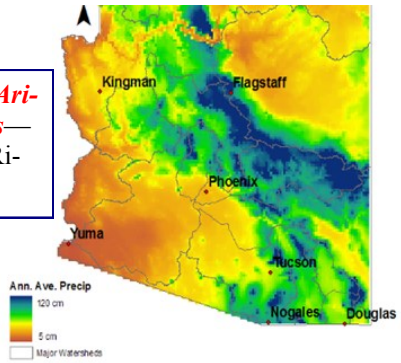


From ***Understanding Arizona's Riparian Areas***— Arizona Climate and Riparian Areas, pg 71



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The Rim also has an impact on the distribution of precipitation. Moist air needs a "trigger" to get it to release its moisture. This is often provided by "orographic lifting" where moisture-laden air from lower elevations is forced by the terrain to rise into cooler temperatures at higher elevations. The Mogollon Rim provides a barrier that causes air flowing over it to lift and cool. Thus the highest average annual precipitation for Arizona follows a distinct band along the Rim. Areas to the west and south of the Rim lack a major terrain feature to lift the moist air into the cooler regions above and retain their moisture. Conversely, the Colorado Plateau to the north and east of the Rim is dry because it lies in the "rain shadow" of the Rim. The moisture is stripped from the air as it rises over the Rim and is dry by the time it arrives at the Plateau.

Winds come from the north in the winter and shift to come from the south in the summer. Prevailing winter flows tend to bring large, cold, sometimes moisture-laden, frontal systems from the north. When the flow shifts in the summer to come from the south, it brings warm, moist subtropical air from the south giving us our summer monsoon. Thus we get two rainy seasons. This is called a bimodal pattern.

The term "bimodal" is just a fancy way of saying that if we plot the amount of precipitation received at any location we will see two "humps" in our plot. One hump represents a winter-spring rainfall period and the other a mid-summer-early fall period. The "valley" between the two humps represents a period of little precipitation during the late spring-early summer. Because the winter precipitation comes predominantly from the north and the summer predominantly from the south, we would expect to see relatively more winter precipitation than summer precipitation in the north of the state and vice versa in the south. And that is exactly what we see.

Our latitude places us on the boundary between the subtropics and the temperate zones. To borrow a term from the military, we are at the forward edge of the battle area in the perpetual war between cooler temperate and warmer tropical air masses. As the battle rages we sometimes find ourselves on one side and sometimes on the other side of the battle front.

In addition to differences in the seasonal distribution of precipitation from north to south across the state, there are also differences in the character of the precipitation received across the seasons. Winter rains are normally associated with large frontal systems and drop their rain or snow "relatively" uniformly over "fairly" large areas, at least as compared with summer rains. The summer rains are delivered from small convective cells that move across the terrain along varying paths, dropping their rain here and there or even not at all as they move. It is not unusual to find locations only a few city blocks or less apart receiving vastly different amounts of rain after one of these summer storms. Although the rainfall for each individual event is spotty, the total rainfall for the whole summer usually averages out to be "fairly" uniform over "fairly" large areas.

We've seen how precipitation varies across the entire state and throughout the year. Now, let's take a quick look at how precipitation has varied across the years in Arizona.

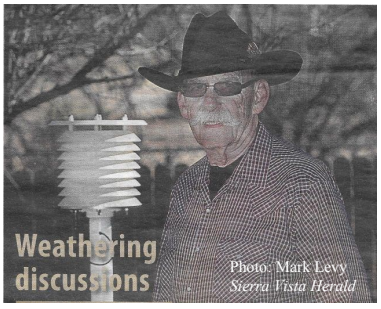
While the geographical and seasonal patterns of precipitation are generally predictable in terms of spatial distribution, the amounts of precipitation received during any one year are not. The amounts can vary dramatically from year to year. For example, I recorded 22.45 inches of rain at my house for 2014, but a year earlier the total was only 12.43 inches. This extreme variability is caused by global-scale changes in atmospheric circulation far from our borders.

Using tree ring data, dendrochronologists have been able to reconstruct a **record of annual precipitation** in the Southwest extending back more than a thousand years showing that this pattern of extreme variability extends far into the past. This, in turn, piques our curiosity about what may happen in the future. Will our current drought get worse? Or will conditions improve? How long can we expect current conditions to persist?

Dr. Crimmins also talked about the latest predictions for long-term climate change in Arizona and the Southwest. His primary source was ***An Assessment of Climate Change in the Southwest United States***, a document prepared as a technical input to the **National Climate Assessment** (NCA) report. An updated version of *Climate Change in the Southwest* is currently in the final stages of preparation and should be published shortly. When that happens, I will review it and write about it in a future column.

Until next time, happy surfing!

Gary Gruenhagen, Master Gardener
virtualgardener@cox.net



Cuttings 'N' Clippings

❄ The Cochise County Master Gardener Association (CCMGA) meeting will be **Thursday, February 8, 2:00 PM**, Room 503 on UA Sierra Vista campus. The speakers will be Dave & Sue Walker discussing their trials and success with Straw Bale Vegetable Gardening. For CCMGA information contact Valerie at: **valeriedvidson@email.arizona.edu** or the Cochise County Master Gardeners web site at: **http://cals.arizona.edu/cochise/mg/**

❄ The February 2018 Water Wise free presentation will be **Saturday, February 10, 9:00 AM to noon** at UA Sierra Vista. Discover the best season to prune and the correct cutting techniques to help your plants thrive with Dustin Hancock, UA Range Monitoring Specialist. He will lecture and lead a hands-on workshop. The event is both indoors and outside, so please dress appropriately. Check out the Water Wise web site at: **http://waterwise.arizona.edu/**

❄ AZ Native Plant Society will not be meeting in February. Their next meeting will be in March at Cochise County Community Development Office, 4001 E. Foothills Drive, Sierra Vista.
For more information, follow AZ Native Plant Society on their web site: **http://www.aznps.com/chapters/cochise/cochise.htm**

Cochise County Master Gardener Newsletter Editor
Carolyn Gruenhagen

25th Annual High Desert Gardening & Landscaping Conference … 25 Years of Celebrating Life in the High Desert

Registration is open for our 25th Annual High Desert Gardening & Landscaping Conference, (yes, the 25th!), produced by the Cochise County Master Gardeners in conjunction with UA Cooperative Extension, Cochise County.

The Conference is set for Thursday-Friday, and half day Saturday, March 15-16-17, 2018 and will be held in the Student Union Building of Cochise College, Sierra Vista campus.

The Conference schedule includes a wide variety of speakers presenting General Sessions, Break-outs, and Workshops. The General Session keynotes include topics on: Soil Science, presented by James Cassidy of Oregon State University; Contemporary Vegetables & Farm-to Table presented by Renee Shepherd of Renee's Garden Seeds (check out the website reneesgarden.com); Neurobotany & How Plants Think by Tony McCammon of Bloom Horticulture Specialists, Idaho; the Magic of Grafted Vegetables by John Jackson of Grafted Growers; Successful Planting Practices of Various Tribes by Dr. JoAnne Mowczko; What is Weather?; and the Truths about GMO's.

Five workshops have been designed for hands-on and interactive activity where each attendee will not only learn, but also create something new to take home. These workshops include: processing pressed flowers and creating an art piece, inviting backyard birds and building bird feeders, Mandala rock painting (surprisingly contagious activity!), creating an Ikebana floral arrangement and Ikebana theory, and a session on propagation of seeds, cuttings, air-layering, and grafting where each attendee will leave with a grafted fruit tree.

Break-out sessions will feature discussions on container gardening, vegetable gardening "hacks" & companion planting, creating rock gardens, mesquite flour production and uses, growing roses in the High Desert, backyard chickens, landscaping with native plants, herb gardens, planning a vegetable garden for home, school, or community, fruit tree care & specific pruning techniques, and more.

You may register for the entire Conference, a combination of days, or a single day. Registration includes full breakfast and lunch on Thursday-Friday, and full breakfast on Saturday. Gardening-themed clothing – T-shirts, denim shirts and ball caps will also be available to purchase on the registration page.

To review the schedule and register for the Conference, visit **cals.arizona.edu/cochise/mg/events**. For more information or assistance with registration you may call the Cooperative Extension at UA Sierra Vista, 520-458-8272, ext. 2141. Cooperative Extension is located at 1140 N. Colombo, Sierra Vista.

Whether you're new to gardening or have had your hands in the soil for years, you'll find new information, spring motivation, and networking with lots of different gardeners. See you at the 25th High Desert Gardening & Landscaping Conference!

Jan Groth, Master Gardener Program Coordinator

Christmas Cocoa In the Discovery Gardens

While stringing lights and hanging Christmas ornaments in the Discovery Gardens, we had a "last minute" idea of having cocoa and cookies in the Gardens and sharing the spirit with our community.

With a very short notice, more than 75 wonderful folks attended the gentle gathering. The Christmas trees, garlands, music, and numerous garden lights offered a warm feeling in the chilly, crisp air of the evening.

Right next to our "Cocoa Bar" sat "Gardening Santa" portrayed by Master Gardener, Mark Grams, who was a big hit. (See photo on page 6.) The children had long visits with Santa and loved him. They also loved petting and interacting with Peanut, the adorable baby goat, and Princess Buttercup, the beautiful black heifer.

We are already motivated and planning for a special seasonal event next year for the community with luminarias, more animals for the kids, Christmas food, live music, and caroling.

Thank you to all those who attended and helped make this a special evening. Watch for Cocoa in the Discovery Gardens next December!

Jan Groth, Master Gardener
Program Coordinator

High Desert Gardening & Landscaping Conference Scholarship Application

Cochise County Master Gardeners Association (CCMGA), in conjunction with University of Arizona Sierra Vista Cooperative Extension, is awarding up to two full scholarships to the 25th Annual High Desert Gardening & Landscaping Conference to be held at Cochise College, Sierra Vista, AZ, March 15, 16, & 17, 2018. A full scholarship pays for full registration for all lectures and workshops each day plus breakfasts and lunches.

Applicants for a scholarship are invited to submit an essay for review on one of the following topics:

The Joys of Gardening in the High Desert
Gardening for Food Production
Landscaping with Native Plants
Environmental Stewardship in Gardening Practices

Essays must meet the following criteria:

1. 750 to 1,000 words in length.
2. The essay must be an original composition and be suitable for publication. All references and authorities cited must be properly documented.
3. Please submit as an attachment (plain text format) to an e-mail to **ccmgasecretary@gmail.com**
Subject: Conference Scholarship
4. Entries must be received no later than close of business on Friday, March 1, 2018.

Entries will be judged by a committee of Master Gardeners appointed by the President of CCMGA. The awardees will be notified no later than Wednesday, March 7, 2018.

By submitting your entry you understand that it becomes the sole property of Cochise County Master Gardeners Association and may be published in the Cochise County Master Gardener Newsletter*.

*The Cochise County Master Gardener Newsletter is a publication of the University of Arizona Cooperative Extension.

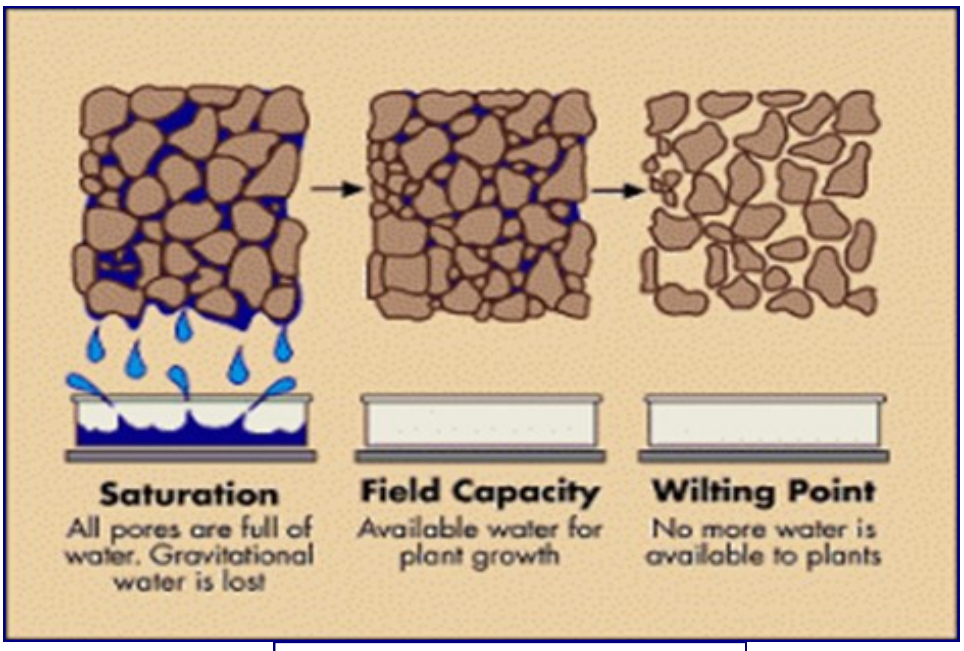
The Ancient Art of Ollas

Last year, those attending the Cochise County Master Gardeners Training, Class of 2017, purchased a selection of *ollas* made by Bisbee High School students in their pottery class. The gardeners took them home to use in their gardens, though it turned out some of them were too pretty to bury. Why bury an *olla*? And what is an *olla*?

An *olla* (the word for cooking pot in Spanish, pronounced oy-ah) is an unglazed clay vessel that is buried under the soil near thirsty seeds or plant starts. The mouth of the pot is left above ground so that the pot can be filled with a hose or watering can. The clay out of which the ollas are made is porous enough to allow water to gradually seep out of the pot, watering roots growing nearby.

This works because the movement of water across the olla wall is stimulated by a water concentration gradient. As the soil dries, due to the consumption of the water in soil pores by plant roots, the gradient becomes stronger, and water leaves the pot. As the soil saturates, the gradient weakens and water remains in the pot until the pores of the soil dry out. This way plants are watered underground as the plants need it. Olla watering proves to be extremely water-efficient. I've read that it can be up to 10% more efficient than drip irrigation.

Buried clay pot irrigation has a long history of over 2,000 years of documented use. It is still used in the dry lands of India, Pakistan, The Middle East, and Latin America. It has been successfully used for a wide variety of food crops, from basil to peas to tomatillos, as well as other decorative annuals and perennials. You can put a mini-olla in a container to water herbs or flowers. If you dig up an olla after the growing season, you'll find roots madly circling the pot.



source: http://bettersoils.soilwater.com.au/module2/images/16.gif

How many seeds or starters do you plant around an olla? It depends on the size of the olla, what you're planting, and of course, your soil. Let's take a note from ancient history!

"Make 530 pits per hectare, each pit 70 cm [about 27 inches] across and 12 cm [about 5 inches] deep. To each pit add 18 kg [about 40 pounds] of manure. Mix the manure well with an equal amount of earth. Bury an earthen jar of 6 liters [1.6 gallons] capacity in the center of the pit. Let its mouth be level with the ground. Fill the jar with water. Plant four melon seeds around the jar. Cover the jar with a tile. Always fill the jar to the brink if the water level falls."

Fan Sheng-chih Shu, one of the first agricultural texts

What about weeds? Since the olla is providing water from beneath the surface, close to the roots, less area of soil receives water: the smaller the area watered, the less chance for weeds to grow.

How often do you need to fill the olla? It depends on the ambi-

(Continued on page 6)

(Ollas continued from page 5)

ent temperature, your soil type, and the number of plants surrounding the olla. Anecdotally, I've heard from once a week to two or three times a week in the hottest months.

Where do you find ollas? Unless you're a potter, you can find ollas on-line, and in some box and hardware stores. These can be pricey. Water Wise will have a low-cost olla assembly station at our Water Awareness Month, Family Day on April 21st. Come put together one of your own and let us know how the watering goes! Bisbee High School students will be selling their fanciful, hand-thrown ollas again for us this year. Please consider supporting them and help us collect information on your olla's success.

Mary Ann Capehart, Cochise County Cooperative Extention, Instructional Specialist, Senior - Water Wise

Ollas made by Bisbee High School students in 2017

"Gardening Santa" and friend

February Reminders

- Winter prune
- Prune roses
- Cold-moist stratify seeds
- Plant bare-root trees
- Prepare spring planting beds
- Clean and repair drip irrigation systems
- Finalize spring garden plans
- Keep watering!

2018 Master Gardener Training Class

Classes begin January 31 and meet each Wednesday through May 23 from 10:00 AM - 1:00 PM in Room 503, Groth Hall, University of Arizona Sierra Vista Campus, 1140 N. Colombo, Sierra Vista.

For information: **https://cals.arizona.edu/cochise/mg/about**

Master Gardener

Cochise County Master Gardeners Association

in Conjunction with

The University of Arizona Cooperative Extension

present…

The 25th Annual High Desert Gardening & Landscaping Conference

…25 years of celebrating life in a high desert garden

March 15, 16, & 17, 2018

An educational experience for everyone with an interest in gardening.

Contact UA Cooperative Extension, 1140 N. Colombo, Sierra Vista, AZ

(520) 458-8278, Ext. 2141.

cals.arizona.edu/cochise/mg/high-desert-conference.

Registration Fees apply and include breakfasts & lunches.

Registration opens in January 2018 and ends Saturday, March 10, 2018.

Conference held in Student Union Building on Cochise College Sierra Vista Campus.

25 YEARS
HIGH DESERT GARDENING & LANDSCAPING CONFERENCE

High on the Desert—HOTD!

This year the High Desert Gardening & Landscaping Conference celebrates a milestone anniversary—its 25th—making it the longest running gardening and landscaping conference in Arizona. This provides a perfect excuse for a short history.

In 1993 my wife and I, along with former Cochise County Master Gardeners Frank and Alice Christ, attended the Arizona Master Gardener Conference in Phoenix for the second year in a row. Over dinner the night after the conference as we shared our experiences, we agreed that we were a little disappointed at what we learned. Almost every presentation was targeted on Low Desert gardening and very little of use or interest to High Desert gardeners was presented. As we talked, an idea began to germinate. Why couldn't we put on a conference of our own oriented on High Desert gardening?

The more we talked, the better the idea sounded. All of us had had some experience in organizing large events, and we were sure we could create a conference. All we had to do was sell the idea to our County Extension Agent, Rob Call, and our fellow Master Gardeners.

The idea wasn't too difficult to sell, so we quickly organized a committee to handle the major tasks—speakers, publicity, registration, facilities, *etc*.—and went to work. Our first challenge was to come up with a name. After several proposals were made and rejected, someone jokingly said, "We wouldn't want to call it 'High on the Desert.'" The name was an instant hit and immediately adopted. It became affectionately known as the HOTD Conference.

One initial problem was a lack of funds. Since there would be some incidental startup expenses, we all chipped in to provide some seed money.

We looked at many options for a conference venue and settled on the Ramada Inn (now the Windemere Hotel & Conference Center). This required us to enter into a contract for a considerable amount of money to be paid after the conference was over. Knowing that we would all be collectively responsible to pay if the conference was a flop, we doubled our efforts and prayed for success.

Success came, and with just 6 months of planning we held our first conference. We had about 100 attendees and 25 session speakers. Many of our attendees came from as far away as Texas, New Mexico, and California, and over the years many have returned year after year and the number of attendees has gone up and down, ranging between 100 and 200.

Over the years, the conference has been held in five different locations—the Ramada Inn/Windemere (1994-1999, 2002-2003, 2006, 2009-2013), Lakeside Activity Center on Fort Huachuca (2000-2001, now demolished), Buena High School (2004-2005), The Palms (2007, now the site of Buena Health and Fitness Center), and Cochise College (2014-2017).

The HOTD Conference was designed to support the primary mission of the Master Gardening Program: providing research-based information about gardening, landscaping, and environmental stewardship to the public. But it has had many other impacts as well. The small profit generated from the conferences has allowed the Cochise County Master Gardeners to provide scholarships to deserving students, to buy many books on gardening and related topics for the County library system, and to support educational projects. In addition, it resulted in the creation of the Cochise County Master Gardeners Association, the renaming of the "Arizona Master Gardener Conference" to the "Arizona Low Desert Master Gardener Conference," and served as the model for the creation of the Arizona Highlands Garden Conference in 2000 which was sponsored jointly by Gila, Yavapai, and Coconino Counties' Master Gardeners.

Congratulations Cochise County Master Gardeners!

Gary Gruenhagen, Master Gardener
virtualgardener@cox.net

Master Gardener