



The Virtual Gardener— The North American Monsoon, Part 1

At this time of year temperatures are measured in triple and the relative humidity in single digits. As gardeners watch their plants turn to toast in the desiccating heat, they anxiously await arrival of the moisture from Mexico that signals the start of Mother Nature’s annual garden party here in the High Deserts of the Southwest and turns the thirsty desert into a sub-tropical paradise. In Cochise County we get almost 60 percent of our rainfall during the summer rainy season—June, July, August, September—and many of us plan our gardening activities around those rains. What is in store for us this year?

I last wrote about the summer monsoon nearly a decade ago and thought it might be time to revisit the topic to see what new information has developed since that time.

Until about 20 years ago meteorologists were arguing whether to call our summer rainy season a “monsoon” or not. In the early 1990s an extensive study called the Southwest Arizona Monsoon Project (SWAMP) concluded

that it is in fact a real “monsoon,” but they couldn’t agree on a name to call it. Was it the Arizona Monsoon, the Mexican Monsoon, the Southwest Monsoon, or what? Finally in 2004 as a result of another massive study, the North American Monsoon Experiment (NAME), they agreed that the effects of our monsoon were truly continental in scope and agreed to call it the “North American Monsoon.”

Like other monsoons around the globe, the North American Monsoon is caused by the difference in temperatures between continental land areas and the oceans. Under the intense summer sun, the continents heat up more rapidly than the oceans. This causes the air over them to rise and draw cooler, moister air inland. As that moister air itself rises above the hot landscape, it cools and the moisture condenses and (hopefully) falls as rain. In the winter, the flow is reversed. The land areas cool faster than the oceans and the air rising over the relatively warmer oceans pulls the cooler, drier continental air out to sea.

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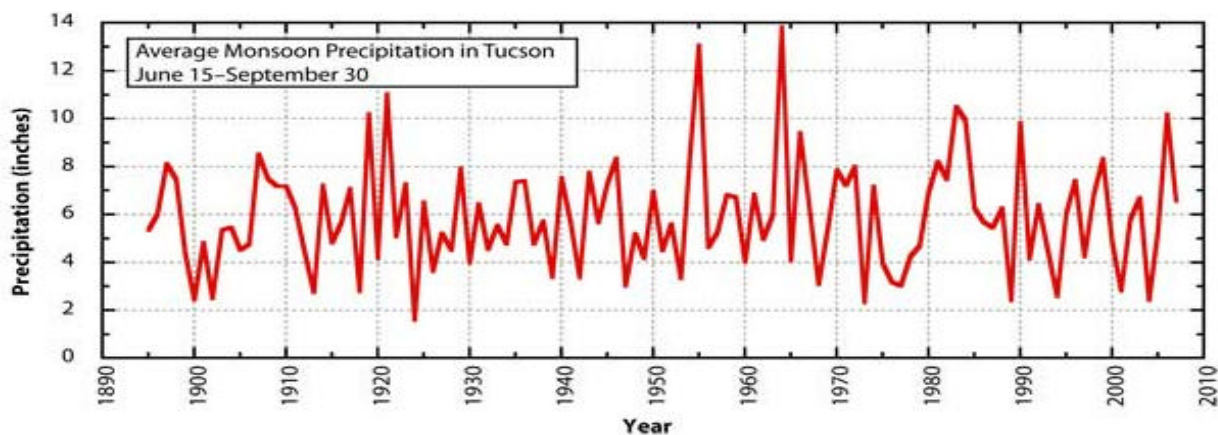
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As simple and elegant as this explanation is, it doesn't go very far in predicting the quality of our monsoon. Will it bring us copious amounts of rain or leave us sweltering in the humidity but without significant rainfall? If past performance is an indication, we just don't know. The graph at the top of this page shows us the record of past monsoons. As you can see, there is no trend and lots of variability.

While we understand the overall mechanism that brings our summer rains, the devil, as usual, is in the details. As scientists dig deeper and deeper into the secrets of our monsoon, they find more and more factors are involved, some enhancing and some suppressing the amount of rainfall we receive. If you would like to learn more about the North American Monsoon, check out this [article](#) from the Southwest Climate Change Network. Stay tuned . .

Until next time, happy surfing.

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In a Desert Garden

Agave filifera

Just when I thought the time has come and I have run out of plants to write about, on one of my walks through my little garden, I came up on this little guy—a small agave. Many, many years ago, I planted a little start of a miniature agave under my honey mesquite. My late husband and I, both rock hounds, found a little start of this plant that had broken off the main plant. The plant was growing in a crevice of the rock wall on the walk up to the claim we had in the Patagonia Mountains. The main plant was just barely hanging on in the rocks that had eroded in the monsoons. I decided to save its life and plant it in my garden. It took some time to re-root this little fellow and get it started, but after a few years it took off and now forms a nice clump of many little plants sitting in the light shade of my tree. Every time I see this plant I remember the wonderful times we had working our claim.

This agave is very small—just as big as my hand. It has a multitude of thin needle sharp pointed shiny green leaves with white lines and filiferous margins that form a stem-less rosette. A little research

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Cuttings 'N' Clippings

✿ On **Saturday, June 2**, 8:30 to 10:30 a.m., the free Water Wise presentation will be *Sensational Succulents and other Cactus*. Spring in the desert is a tough time for most plants because of the heat and dry winds, but succulents love it! Come learn about the wide variety of succulents you can plant in your yard and how to care for them. Presenter will be Mark Sitter, B & B Cactus, Tucson. Plants will be for sale after the talk. The presentation will be held in the Public Meeting Room at UAS. For a list of 2012 Water Wise presentations go to: <http://cals.arizona.edu/cochise/waterwise/events.html>.

✿ The **June 7, 2012** CCMGA meeting will be held at 5:00 p.m. in Room 503 at UAS. Sierra Vista Fire Chief, Bill Miller, will be the speaker. He will talk about the Monument Fire last year and how to prepare for the fire season this year. This talk is open to the public. At the following business meeting, the election of new offices will be held.

Seed Saving For Home Gardeners

This is (finally) the year that is going to be my first for seed saving. Aside from saving my own garlic, I've avoided "real" seed saving in the past for several reasons. First, I am fairly new to gardening and I didn't want to complicate my gardening experience too quickly. The pests, heat, and winds do that enough already. Secondly, I was unsure exactly how to do it. I didn't want to be saving seed that was accidentally hybridized or not viable. Thirdly, reading through seed catalogs is just so much fun and some of the varieties described therein are just too irresistible, so I've ordered them instead of saving seed. Hey, it's the easy way. Now, though, it's time to start a real seed saving effort of my own.

There are good reasons for saving your own seed. Even though seed purchases are usually a relatively minor expense, saving your own seeds is certainly less expensive than buying them every year. More importantly, if you save your own seed by carefully choosing the seed from particularly "good" plants in your own garden, you can adapt your favorite varieties to your local climate and soil conditions. Also, as we read and hear more and more often, seed saving contributes to genetic diversity, which is clearly a good thing.

Seed saving by individual gardeners is the way that so many of the heirloom varieties that are so popular now have been preserved. It's also the reason why many heirloom varieties don't do well here in the high desert. The legendary 'Brandywine' Tomato, for instance, is named after the Brandywine River in Pennsylvania, where it's reputedly been saved

for many decades by Amish farmers in that area. Given the differences in Pennsylvania climate and soils versus ours here in the high southwestern deserts, it isn't at all surprising that my experiences in trying to grow 'Brandywine' the last three summers have been met with disappointment. 'Brandywine' is adapted to cooler temperatures, higher humidity, and soils that are more acidic than ours.

My approach to beginning seed saving is going to be fairly simple and will focus only on tomatoes for the foreseeable future. Tomatoes are generally inbreeders, which is to say that they self pollinate. Most tomato varieties have a flower structure that is conducive to self pollination; they don't need bees or other insects to help them pollinate, although bees certainly can cross pollinate tomatoes. Wind (in Cochise County?!) and the resulting vibration of the flower are sufficient to pollinate tomatoes. As such, this means that my tomato seed should generally be true from year to year, hence no oddball hybrids. The same thing can't be said for peppers or members of the melon family, which typically cross readily. The last thing I want to do is plant a watermelon seed thinking it'll grow me a Georgia Rattlesnake only to find it produces some odd, tasteless melon that took up a significant part of my garden all summer long to no good end.

To find likely seed worthy of saving, I'm growing a number of tomato varieties, all open-pollinated. I'm growing a few hybrids, too, but I won't save seed from them since hybrid seeds won't come true next season. From the open pollinated plants, I'll select those plants that did the best during the year, whether "best" means plant vigor,

disease resistance, heavy production, or tasty tomatoes (all of the above would be nice!). Promising candidates to date include 'Tommy Toe', 'Japanese Black Trifele', 'Stump of the World', and 'Wapsipinicon Peach'.

Here are a couple of books that I'm consulting for guidance: Carol Deppe's book, *Breed Your Own Vegetable Varieties: The Gardener's and Farmer's Guide to Plant Breeding and Seed Saving*, (available in the Sierra Vista Public Library) and Suzanne Ashworth's *Seed to Seed*. Both are very good, in my opinion, and I recommend them (and have done so before in the August 2011 edition of this newsletter). The Deppe book also gives an excellent explanation of genetics and explains how to create your own hybrids, as well as how to de-hybridize a variety to produce an open pollinated equivalent. You can create your own 'Early Girl' or 'Better Boy' and save seeds from it! That sounds like a great project somewhere down the road.

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June Reminders

- ◆ Check tree ties
- ◆ Remove stakes if tree can stand alone
- ◆ Mulch trees & shrubs
- ◆ Remove faded flowers & fertilize roses
- ◆ Stake tomato plants & watch for curly top—remove
- ◆ Prevent blossom end rot by even watering
- ◆ Water! Water! Water!

History of Gardening: The Romans

Agriculture was highly prized as the elite way of life among Romans. In fact, Cicero said in his essay *De Officiis* or *On Duties* that “of all the occupations by which gain is secured, none is better than agriculture, none more profitable, none more delightful, none more becoming to a free man” ^[1]. Other Roman authors such as Cato, Palladius, and Varro also wrote books praising the merits of the agricultural profession. Owning land was a sign of wealth and prestige and the more land one owned the more he was revered in the social hierarchy within Rome.

The Po Valley to the north of Italy was considered a supreme area for agriculture because the soil is very rich, providing a perfect place to grow grain. Central Italy was good for growing wheat because it had heavy soils. The volcanic soils in the southern end of Italy were best for growing grapes for wine. Besides perfecting their knowledge of individual soil types and what grew best in them, Romans perfected the art of manure as soil amendment. Poultry manure was considered the best all around because that is what worked best for them. They did not consider cattle manure as effective, but sheep and goat manure were also preferred by them.

Aqueducts are what the Romans are most noted for. Many of them were used to power mechanical wheels thus reducing labor and increasing efficiency. Mechanical mills powered by water were used in Gaul and Rome in the 1st C. to grind corn. The best example of these so-

phisticated innovations was in Southern France near Arles where sixteen waterwheels fed each other one after the other in two rows. These mills ran from the 1st C. to the 3^d C. AD. Romans developed two ways to power the water wheels. Vertical overshot water wheels worked by water being fed into buckets at the top of the wheel and the weight of this water turned the wheel. Undershot water wheels worked the opposite with water passing underneath the wheel forcing the wheel to turn.

Some of the challenges Roman farmers faced were similar to those farmers face today. Others were unique. Farmers still had to deal with destructive weather and pests. Roman farmers, however, also had to deal with slave rebellions and the constant threat of invasion from foreign forces. Rome had many enemies and farmers often lost their property during such invasions.

It can be clearly seen how the Greeks and Romans paved the way for modern farming with their inventions and agricultural improvements. Simple machin-

ery replaced the animal and human labor, allowing for easier production and higher yield. Their study of soils, seeds, and manures has influenced us even today. Modern horticulturists still study these things to help farmers of the 21st C. grow produce as efficiently and abundantly as possible.

Next month: Agriculture in Biblical times.

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Roman aqueduct

Fertilizing Trees

Fruit Trees

Of the three macro nutrients—nitrogen, phosphorous, and potassium (N-P-K) required by law to be stated on fertilizer packaging – only nitrogen (N) is needed for established fruit trees growing in most of SE Arizona. As the season progresses, minor nutrients such as iron and zinc may need to be applied. The amount of N needed for proper growth is determined by measuring the inches of trunk diameter six inches from the ground. This figure is multiplied by 0.1 pounds of actual nitrogen for apples and pears. For peach, cherry, other stone fruits, and grapes multiply trunk diameter by 0.05 for actual nitrogen requirement. For example: An apple tree has a 4 inch trunk diameter, so it needs 0.4 pounds of actual nitrogen. Ammonium sulfate (21-0-0) contains 21% of actual nitrogen or 21 pounds of nitrogen in 100 pounds of fertilizer. Divide 0.4 by 21% equals 1.9, or just under 2.0 pounds of 21-0-0 fertilizer, will be needed for the tree in question for the year. I recommend a split application. Apply one-third as buds begin to swell in early spring. Then another third six weeks later because our sandy soils do not hold water and nutrients very well. Also, N leaches through the soil profile out of the root zone. The last third should be applied in early fall. Distribute the fertilizer around the tree drip-line and water in. The same calculations would be made for

“organic” fertilizers. Remember than manures usually have only one or five percent N. For example using steer manure, a four-inch diameter tree requires 0.4 pounds of nitrogen. Divide 0.4 by 1% equals 40 pounds of steer manure per tree.

For further information refer to *Backyard Fruit Production*, Cooperative Extension Publication, April 1997

<http://ag.arizona.edu/pubs/garden/az1162.pdf>

(Note: Reprinted from the April 1997 Cochise County Master Gardener Newsletter written by Robert E. Call, Horticulture Agent.)



Ornamental Trees and Shrubs

Ornamental trees and shrubs planted in fertile, well drained soil that are growing normally do not need extra nutrients. If they are not doing well, fertilization may be helpful, but only after the problem causing poor growth is corrected. Symptoms of poor growth may be light-green or yellow leaves,

smaller and/or fewer than normal leaves or dead spots, wilting of foliage, few flowers, short annual twig growth, and branch tip die back. These symptoms of poor growth may be caused by poor environmental situations like inadequate soil aeration and moisture or nutrition, adverse climatic conditions, wrong pH, or insects and diseases.

Normally the only nutrient applied to established trees and shrubs is nitrogen N. Other situations like chlorotic leaves, manifested by yellowing of leaves but veins remaining green, require specific applications of a nutrient, in this case iron. The amount of N needed will depend on the size of the plant. Measure the diameter of the trunk about one foot from the ground. Apply 0.05 pounds of actual nitrogen per inch of trunk diameter. If a tree has a trunk diameter of six inches, multiply by 0.05 to get 0.3 pounds of actual nitrogen. Divide the amount of N by the percentage of N content of the fertilizer to be applied. For example: 0.3 pounds of N applied as 21% ammonium sulfate would be $0.3/21\% = 1.43$ pounds of ammonium sulfate fertilizer from the bag.

Distribute the fertilizer evenly by measuring the distance between the trunk and drip line and multiply by 125%. This will determine the outer boundary radius for fertilizer application. Distribute the fertilizer evenly in the outer 2/3 of this circle. For example if the trunk is

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Did You Know . . .

About three years ago the Southern Arizona Veterans Memorial Cemetery (SAVMC) was making arrangements to move the remains of about 58 Civil War Veterans to the SAVMC in Sierra Vista. The remains were found in Tucson when a parking lot was being removed. Donations were solicited to fund the “cemetery within a cemetery.”

Cochise County Master Gardeners Association made a donation of \$1,000 for plants to be used in this cemetery. Master Gardener Jan Groth was instrumental in obtaining discounted plants from Desert Trees in Tucson. She also masterminded the project with the help of Boy Scouts, SAVMC employees and other volunteers. The Historical Cemetery was dedicated on May 16, 2009.

On May 12 of this year, Jan led a group of Master Gardeners on a walking tour of the Historical Cemetery as well as through other projects she has been involved in in the SAVMC. We have put together a five minute video for your enjoyment—[Click here](#). We would also like to thank Arizona’s Official State Balladeer, Dolan Ellis, for permitting us to use the song he wrote for and sang at that dedication, “May They Rest in Peace Renewed.” We have just celebrated Memorial Day and hope that you will join us in remembering all our servicemen and women who have given so much to protect our freedom.

*Carolyn & Gary Gruenhagen
Master Gardeners*



(Fertilizing Trees continued from page 5)

eight feet from the drip line, then the outer boundary will be ten feet, ($8 \times 125\% = 10$). Apply fertilizer around the tree or shrub in a doughnut-shaped band 3.3 feet to 10 feet from the trunk, ($10/3 = 3.3$). Applications are best applied in early spring.

(Note: Reprinted from the May 1997 Cochise County Master Gardener Newsletter written by Robert E. Call, Horticulture Agent.)



(Agave filifera continued from page 2)

told me it was a native to Mexico but is also found in southern Arizona. There must be more than 10 individual plants growing under my mesquite, and now one has decided it is time to bloom. The agave has sent out a long stem into the branches of the tree, reaching for the sun. Everyday it seems to grow longer. Now it has reached about six feet and I can see the flowers forming. How exciting it is to watch all this going on. What will the flowers look like? One of my books says that the flowers will be greenish-yellow—we will see!

Angel Rutherford, Master Gardener



*Agave filifera
Photos by Angel Rutherford*