High on the Desert Cochise County Master Gardener Newsletter

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The Virtual Gardener—Sand: the Miracle Mulch

A couple of years ago I was collecting a bucket of sand from the wash behind my house to make a potting mix for a cactus. It was the first of June. The humidity was in single digits and the temperature in triple digits. We hadn't had a drop of rain for months. The sand was bone dry, but about six inches below the surface I found a layer of moist clay and silt. That got me to thinking about using sand as mulch around my plants. Since that time I have made extensive use of sand mulches and I intend to make even more use of them in the future.

I am a rainwater harvester, but unlike other harvesters, I do not have a collection of large tanks to hold rainwater or a sophisticated pumping and distribution system to move the harvested water around. I operate on the principle that the best place to store water is in the ground and sand mulches play a big part in the strategy I use to get water into the ground and make it available to the roots of my plants.

When water hits the ground—whether from rainfall or from an irrigation system—one of three things can happen to it. It can remain on the surface and run off to somewhere else; it can soak into the soil; or it can evaporate back into the air. Unfortunately, much of the water that falls in our desert environment evaporates and blows away to some other place. Even water that initially soaks into the ground cannot escape evaporation. Depending upon the soil type, ultimately most of it will be wicked back up to the surface by capillary action and evaporate.

Sand mulches allow water to infiltrate rapidly to the depth of the sand and resist capillary movement back up to the surface. If the underlying soil has a higher water-holding capacity, the water will remain there until it is taken up by your plants. In effect the sand mulch is like a one-way door that allows water to flow in but does not let it out again.

Sand and gravel mulches have been used throughout the ages to mitigate the loss of water to evaporation (and to stabilize soil temperatures).

Ancient Indian farmers in the desert Southwest have used sand and gravel as mulches for centuries. The Hopis and their ancestors used sand and gravel mulches to grow their crops in the arid regions of the Colorado Plateau [**more information**]. The sand, with its small pore spaces, held the water while the gravel, with its large pore spaces,

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Inside this issue:

Cochise County Cooperative Extension
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allowed water to freely penetrate to the sand below and provided both an insulating layer and a heat sink to moderate the temperatures below.

Farmers in northwest China have used sand and gravel mulches for at least 300 years [**more information**]. This area has a fairly arid climate, a cool climate, and fast-draining loess soils. Controlled experiments conducted there to determine the effects of various combinations of sand and gravel mulches on soil temperatures and evaporation showed that mixed sand and gravel mulches were most effective in warming the soil and promoting earlier germination and emergence of crops as well as reducing overall evaporation. The experiments also looked at the effect of various combinations of sand and gravel mulches in reducing runoff. These results indicated that gravel and mixtures of sand and gravel were more effective in reducing runoff than pure sand or pure soil.

Several studies [**more information**] have investigated the use of "sand tubes" as a way of increasing the effectiveness of drip irrigation. The amount of water lost to evaporation from a drip system depends upon the type of soil under the drip emitter. Slowly draining soils become saturated and lose water to the air before it can penetrate to the root zone of

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Robert E. Call
Area Horticulture Educator

Carolyn Gruenhagen
Editor

Cuttings 'N' Clippings

❄ The next CCMGA meeting is 5:00 p.m. **Thursday, August 4.** Katie Johnson, the Fire Ecologist from Zion National Park, who is on temporary duty at the Coronado National Memorial, will discuss the Monument Fire. She'll explain how the fire affected the Memorial and the restoration treatments recommended by the Burned Area Emergency Response Plan. She'll give some details about how restoration treatments prescribed in the plan will address flooding issues as well as the native and non-native plant issues in the grassland area of the Memorial. She'll also discuss the need for volunteers to assist in planting agaves.

❄ The next FREE Water Wise presentation will be **Saturday, August 6** from 9:00—10:30 a.m. in the Public Meeting Room of the University of Arizona South. Low water plants for low water gardening will be the focus of this talk, along with good landscape design and water harvesting tricks of the trade. The presenter will be Greg Corman, Gardening Insights, Tucson. For information call Joyce at 458-8278, Ext. 2141 or email **jwilliam@ag.arizona.edu** This presentation will be repeated at Ecoasis, 54 Brewery Ave., Old Bisbee in the afternoon from 1:00—3:00 p.m.

❄ On **Saturday, August 13**, a Bisbee Plant Walk will be held with "Petey Mesquitey"—plant expert extraordinaire! Contact Water Wise at **waterwise.arizona.edu** for time and location.

❄ It's U-Pick time again! For information and brochure go to: **www.willcoxchamber.com** and then Special events where you will find U-Pick.

❄ The Water Wise fall Xeriscape tour will be held on **Sunday, September 4.** Maps will be available later in August. Contact the Cooperative Extension office for info.

❄ The **Arizona Highlands Garden Conference 2011** will be held **October 22** in Prescott. General information, registration information, trifold brochure, preconference activities, and other details are available at: **http://ag.arizona.edu/yavapai/ahgc/**

❄ The Cochise County Fair will be held at the fairgrounds in Douglas on September 22—25. For information go to: **cochisecountyfair.org**

❄ **Did you know . . .** Rob Call celebrates 20 years as the Cochise County Area Horticulture Educator/Agent on August 19!

Congratulations Rob!

August Reminders

- Keep pulling the weeds
- Fertilize
- Prolong annuals
- Plan your spring wildflower garden
- Watch for nutrient deficiencies, sunburn, salt burn, overwatering and insects
- Plant cool-season flowers and veggies

Beat Chiggers, Read A Book

Whew! This has been one rough year, what with a record freeze, awful forest fires, and then the flooding in the canyons of the Huachucas. And now, just when it seems things can only get better, comes another cruel break—chiggers are back! Does evil never take a rest?!

OK, I'm not seriously equating the annoyance of chigger bites with a real disaster such as a forest fire, but chiggers sure can detract from the quality of life. Pound for pound (or maybe more appropriately, microgram for microgram), few creatures can compete with the chigger when it comes to causing human discomfort and misery. If you aren't familiar with chiggers, be thankful, very thankful. If, on the other hand, you are cursed with chiggers on your property, the best solution I've found for preventing their oh-so itchy bites is to take a warm shower after working in the yard. Scrub every part of your body, and I do mean every part, with a soapy washcloth or a brush. You can find more information on chiggers, aka "Spawn of Satan," in the July 2009 issue of this newsletter.

One of the effects of chigger season is that I make fewer trips into the garden since each trip, no matter how short, means a shower is necessary. Less time in the garden means more time for reading, so, this month, I'd like to recommend three books for your reading and gardening pleasure (how's THAT for a tortured segue!).

Two of the books are by an Oregon gardener, Carol Deppe. Ms. Deppe, who has a Ph.D. in biology from Harvard University, packs her books full of useful information. Fortunately, she also writes in a very accessible and enjoyable manner. The first of her books is entitled *The Resilient Gardener: Food Production and Self-Reliance in Uncertain Times*. This book focuses on ways to make your garden, well, more resilient, as well as more reliable. Ms. Deppe, who takes self-sufficiency much farther than most of us ever will, has written a book that has valuable tips for everyone from the novice gardener to the seasoned pro. She addresses planting techniques, planting timing, selection of vegetable varieties, tool selection and use, preservation of the harvest, and much more in an easy to read style that keeps your attention. I guarantee you'll learn something from this book.

The second Deppe book, *Breed Your Own Vegetable Varieties: The Gardener's and Farmer's Guide to Plant Breeding and Seed Saving*, is available in the Sierra Vista Public Library. The book begins with the story of a high school student somewhat haphazardly breeding a new variety of watermelon, Blacktail Mountain. Blacktail Mountain turned out to be a big success; you just may have run across it in seed catalogs. As her book progresses, you'll read about Gregor Mendel, tall and short pea plants, smooth and wrinkled peas, genetic mutations, alleles and more. It's like high school biology all over again, only well written and interesting. As the book's title suggests, seed saving techniques are also addressed.

Another excellent book, this one focusing strictly on seed saving, is *Seed to Seed: Seed Saving and Growing Techniques for Vegetable Gardeners*, by Suzanne Ashworth. This book, considered by many to be the definitive book on seed saving, is also available in the Sierra Vista Library. If you are interested in saving seed, it isn't as simple as you might think. You really need to read one or both of the above books to do it properly. As an example, tomato seed must be fermented before it's saved. Also, cross pollination can result in seed that isn't true to the variety you want. Techniques to prevent cross pollination are discussed in this, and Deppe's, book.

One of my personal quests is to find a large, beefsteak-type tomato variety (you know, for BLTs) that will do well and yield heavily here in the High Desert. That doesn't necessarily mean that I need to breed a new variety; it might be as simple as saving seed from a promising tomato variety each year to gradually select for the characteristics I want. However it works out, the information from Ms. Ashworth's and Ms. Deppe's books makes my goal seems reasonable, not to mention attainable. Heck, I've already selected a name for the as-of-now-only-a-dream tomato variety, which I imagine will be a big red tomato streaked with orange and yellow; it'll be called Sierra Vista Sunset (sunrise is just too early for me).

Bill Schulze, Master Gardener
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As the garden grows, so does the gardener.

- Anonymous

In a Desert Garden

Yellow Evening Primrose
Oenothera elata hookeri

Like so many plants in my little yard, this one just arrived one day. It was never planted by me. I noticed this unusual plant growing close to my wall on the left side of my home. It was nothing but a gray green rosette growing in the shade of my *Pyracantha* that I had trained into a small tree. I really loved this little *Pyracantha* tree with the sturdy trunk and the ball-like top of shiny green leaves, small white flowers in the spring and red berries in the fall, Doves made their nest in it. Well, it is no more—yesterday we finally took it down, another casualty of the big freeze. But back to the evening primrose.

A longtime ago I made the decision to never pull a plant as long as I am not sure what it is and before I know that I do not want it. Anyway, it was not in my way and it was growing in a part of my yard where it didn't really matter. The year went by and I had almost forgotten about its existence when one day the next spring I noticed that out of the rosette has grown long stems with lance shaped, gray-green leaves, almost 4 feet tall. Now I was very interested in finding out what the plant will look like as it had developed flower buds. One morning, I realized that the plant had already flowered and I missed it. The spent flowers were orange. It took me a few days to realize that apparently this plant flowers in the evening. Then one late afternoon I saw the beautiful yellow flowers. They had the typical shape of the primrose family and were formed in clusters. At the time I was volunteering at the Ramsey Canyon Preserve and had seen the evening primroses, a native, there. This plant is a perennial or a biannual. In my yard, it is a biannual. It has been growing here for years, but it wanders around where the seeds fall or get blown to. This year it is growing in my side yard where my potting area, holding tanks for some of my fish, and extra water plants are located. It is growing next to a little pond that holds a variety of water lilies and other plants and the breeding pond for my miniature goldfish. It is an area that is very popular with my frogs and the new arrivals from Miller Canyon that have set up house here and have mated.

The evening primrose is a majestic plant that likes some shade and loves water, but this year it is growing in full sun and has had to endure quite a bit of drought. This plant is native to our canyons where it likes to grow close to the washes. It also can be found in the western states all the way south into northern Mexico. The down side is, of course, it is not a plant that is in the nursery trade. The best bet is to check for it at Farmers Markets in Sierra Vista and Bisbee.

Angel Rutherford, Master Gardener

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the plants. One way to overcome this problem is by setting the drip emitters on top of a column of sand that reaches to the depth of the root zone. Water from the emitter rapidly penetrates down to the root zone before it can evaporate from the surface.

I have used sand mulches in several different ways—behind berms, in basins around trees and shrubs, and as sand tubes.

A good way to trap water on slopes is by building berms. First dig a shallow trench piling the soil removed on the down-slope side of the trench to form the berm. (You may also want to reinforce the berm with rocks or bricks on the down-slope side). Then back fill the trench with sand. Water flowing down the slope is captured behind the berm and sinks into the sand. The stored moisture is available to plants growing on the berm.

A variation of the berm idea is to build a berm completely around a tree or shrub just beyond the drip line. This creates a basin which can be used to irrigate the plant when supplementary water is required and to trap rainwater when it rains.

A technique that can be used by itself or in combination with berms and basins is a sand tube. I use a posthole auger to bore a 12-inch diameter hole to root depth and fill the hole with sand. This allows the water to quickly penetrate to a depth where it becomes available to plants.

Coarse sand—the coarser the better—is the best sand to use for mulch. The fine sand used in children's sand boxes or to mix with mortar tends to hold more water than coarse sand instead of letting it quickly drain away.

Until next time, happy surfing!

Gary A. Gruenhagen, Master Gardener
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The Agent's Observations

Q What are the problems we are having with our corn? Included are some photographs. There are worms in the large end of the corn ears and tips of the corn ears. What can be done about these pests? Also, the corn ear is not filled out all the way to the tip. Why is this and what can be done about it?

A There are three corn problems. Photo #1 shows Southwestern corn borer (*Diatraea grandiosella*) damage.

These moth larva bore into the butt end of the corn. Planting early in May is the best control. *Bacillus thuringiensis*, a biological insecticide known as B.t, can be applied as soon as ears form and before egg laying begins. Once the larva is inside the corn ear nothing can be done. Photo #2 shows two problems. The first is corn ear worm (*Helicoverpa zea*). They are moth

larvae. Applying a few drops of mineral oil with a medicine dropper to silks just inside each ear 3 to 5 days after silks first appear may be effective. Applications of insecticides, such as spinosad, must be applied on silks within 3 days after first silks appear and at 3-day intervals until silks turn brown. B.t. may be dusted or sprayed on silks every 3 days after 5 to 10% silk formation for partial control. The other issue is the tips of the ears are not filled out. This is due to pollination problems. The silks in the middle of the silk bundle are attached to the kernels in the ear tip. With warm weather pollen develops and sheds more rapidly. Also, the silks dry out faster so they are not receptive to the pollen for very long.

Source:
http://www.ipm.ucdavis.edu/PMG/GARDEN/veggies.html

Q Have you heard of black salsify? It is a cold season vegetable with a black skinned root, almost like radish or horseradish. When peeled and cooked it is a white/creamy color and tastes similar to asparagus. Will it grow in southeast Arizona? What are the growing requirements for black salsify?

A Black salsify, also known as Spanish salsify or oyster plant, is a cool season crop grown primarily for its long, brown-black roots, but its leaves can also be used as fresh greens for salads. The roots of black salsify tend to be longer, smoother, less fibrous, and of a finer texture than regular salsify. It is also more cold hardy, but requires about the same length growing period as regular salsify, which is 120 days. The cultural practices for both are also generally the same. Both have an oyster-like taste which gives them the name "oyster plant" and both are highly suitable for diabetic diets. Purchase high quality seeds from a local nursery or seed catalogs. The seeds should be sown directly into the soil in early fall so there is no need to grow trans-

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August 19 marks the 20th anniversary of Robert (Rob) E. Call's employment as the Cochise County Agriculture Agent, Horticulture. Because of extended duties in other counties, he is now known as the Area Horticulture Educator/Agent.

Rob has a B.S. degree in Horticulture from Brigham Young University and he earned a Masters degree in Plant Science from Utah State University.

Rob is fluent in Spanish, having lived in Latin America for five years, and has many interests including pottery, basketball, piano playing, and of course, gardening. He and his wife Suzanne are the parents of five children and they make their home in Willcox. Rob travels a great deal and has done horticulture projects in Tajikistan, Kyrgyzstan, Dominican Republic, and China. He also teaches a yearly Master Gardeners Course.

Cochise County is very fortunate to have him!

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plants. Salsify prefers deep, fine textured, well drained soils with good water holding capacity. Work the soil 18-24 inches deep to reduce compaction so the plants can develop long, straight roots with few deformities. Plants prefer to grow in soils with a pH level of 6 to 8. Before planting, incorporate 2-4 inches of well composted organic matter and 4-6 cups of all-purpose fertilizer (16-16-8 or 10-10-10) per 100 square feet of planting area. Rocks and other large objects should be removed to reduce root deformities. Salsify originated in southern Europe so it prefers a regular supply of water, keeping the soil at a constant moisture level. Irrigate with 1-2 inches of water per week to maintain a moist, but not wet soil. To sidedress fertilize apply ¼ to ½ cup of a nitrogen based fertilizer (46-0-0 or 21-0-0) per 25 foot of row in mid-fall. Place the fertilizer to the side of the plants and irrigate it into the soil. Salsify is not susceptible to many common pests and disease problems. Rotating planting locations from year to year helps control most diseases. To control weeds cultivate shallowly and avoid root-pruning to ensure uninterrupted growth. Each plant produces one root and several leaves that are available from late fall to early spring. Plant 5-10 feet of row per person for fresh use and storage purposes. Salsify roots are very hardy and are not damaged by freezing so roots can be dug, topped, and stored or left in the garden until needed. If left in the soil, mulching with straw may be helpful. Roots can get brittle when frozen so they should be handled with care. Store salsify like topped carrots. Store roots at 32°F and 95-98% relative humidity. High humidity is important to keep roots from shriveling. When stored correctly black salsify roots should last about six months.

Source:
http://extension.usu.edu/files/publications/publication/HG_Garden_2006-02.pdf

Robert E. Call
Area Horticulture Educator