



The Virtual Gardener—Roots Out of Sight... Out of Mind

My attention has been directed to the importance of plant roots several times in the past month. It all began when I listened to a fascinating online video **presentation** by Stefano Mancusco, who discussed the role of roots in interplant communications. Mancusco, founder of the study of plant neurobiology, is the director of the International Laboratory of Plant Neurobiology in Florence, Italy, the only lab of its kind in the world. Then I read a **report** on the role of mycorrhizae in interplant signaling. Mycorrhizae are the symbiotic fungi that inhabit the roots of most plants. And finally I attended a great talk on arboriculture by DeForest (De) Lewis, longtime Cochise County Master Gardener and International Society of Arboriculture (ISA) Certified Arborist, who stressed the importance of roots to the health of trees.

As my title suggests, to many gardeners, roots are the most neglected and unappreciated parts of their plants. Many gardeners never even see the roots of the plants they install. The roots are the part of the plant that is hidden in the ball of soil or other

planting media they see when they take a new plant out of its nursery container. And that ball immediately disappears into the planting hole never to be seen again.

In fact, roots are one of the most important parts of a plant. They mine the soil for water, nutrients, and oxygen; they provide a place to store food reserves; they produce hormones; and they anchor the plant to the soil to provide stability for its above ground portions. Gardeners should be concerned for the health of the roots of all their plants but especially large, long-lived plants like shrubs and trees. Root problems with smaller plants such as grasses and annual or perennial flowers will likely manifest themselves quickly. If the plant dies, it is easily and inexpensively replaced. But root problems with large shrubs and trees may take years to become apparent and replacement of the plant will be difficult and expensive.

Although there are many potential problems that can develop with the roots of large shrubs and trees, I want to focus on two in this article, both

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correctable when the plant is originally installed and both often taking many years to become apparent if ignored.

The first problem is girdling roots. Trees that have grown up in containers do not develop the same healthy root structure as a tree grown in the ground. The depth of a container limits the length of the initial tap root that tree seedlings naturally develop. If you carefully dig up a tiny mesquite seedling growing in the ground, you will see a very long tap root that exceeds in length the height of the above ground portion of the seedling. Although this tap root will not continue to lengthen indefinitely as the tree grows, it does establish the basis for the development of healthy lateral roots.

The walls of the container similarly constrain the lateral spread of the roots of container-grown plants, especially when the developing plant is not regularly “bumped-up” to larger containers. In the worse case, large roots may develop and begin to grow in a circle inside the container. If such a plant is installed in the ground, the circling roots will continue to circle, cutting off supplies of nutrients and water to the upper parts of the plant and slowly choking the life out of it. Trees with girdling roots may take five

to twenty years to die and little can be done to assure their survival once the condition has progressed for several years.

Always check the roots before you buy a plant to avoid purchasing a plant with this condition but if you do, all is not necessarily lost. If the offending root is cut off before the plant is installed in the ground, the plant may be able to develop a healthy root structure and avoid death by girdling. In addition to pruning off circling roots, De suggests washing all the potting media off the roots and spreading them out radially in the planting hole when you install the tree. Just be careful not to allow the roots to dry out when you do this.

A second major problem that may not appear for several years is caused by planting the tree too deep. The base of the trunk of a healthy tree is slightly flared just above ground level. This so-called *root flare* marks the transition zone between the above ground and below ground parts of the tree and is a very sensitive area. If it is buried (or even heavily mulched), girdling roots may develop here after the tree has been in the ground for a while or the tissue there may begin to rot. Always locate the root flare in a container-grown tree or shrub before you plant it and make sure the root flare is not buried when the plant is installed.

Tree planting standards developed by the University of Arizona recommend that the planting hole should never be excavated deeper than the height of the root ball of the plant. If the hole is too deep and the tree is set on the bottom of the hole, the root flare will be buried when the soil is shoveled back into the hole. If

the hole is too deep and loose soil is placed in the bottom of the hole to raise the level of the plant, there is a good chance that the plant will sink in the ground burying the root flare as the loose soil compacts.

In addition to the conditions I have discussed here, there are many other problems that can develop with roots. To learn more about this important topic, search on Google for “tree roots.” You will get more than two million links to explore. Here are a couple of links I found particularly informative:

Tree roots in general
Girdling tree roots

Until next time, happy surfing.

Gary A. Gruenhagen, Master Gardener
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Cochise County Master Gardeners Association recently donated \$1,000 to the Sierra Vista Public Library for the purchase of books that will be of use throughout the Cochise County library system. A suggested list of nearly two dozen books helpful to the High Desert Gardener accompanied the check. For information on the County’s library system click [here](#).

Robert E. Call

Robert E. Call
Area Horticulture Educator
Carolyn Gruenhagen
Editor

Garden Myths: The Facts and Maybe an Opinion or Two

Here's a quick look at a few things many of us believe that just ain't so.

Yams Are A Thanksgiving Treat: Nope, very few of us have ever eaten a yam. Yams are actually related to lilies and grasses, while sweet potatoes are members of the morning glory family. Yams are usually quite large; they can grow to seven feet in length and are the edible root of a tropical vine. Yams have not been readily available in the U.S., although this is changing with the increase in the number of ethnic grocery stores. Sweet potatoes, which are also roots, come in a variety of flesh colors, ranging from white through yellow to deep orange. The term yam came into use to describe sweet potatoes back in the 1930s when growers in Louisiana began using the term to differentiate their orange-fleshed, moister, variety of sweet potato from the yellow or white-fleshed varieties that were commonly available at the time. Sweet potatoes, by the way, are easy to grow in most of our area.

Potatoes Are Roots: Nope, again. A potato is actually a tuber, which is a form of underground stem. The eyes on the potatoes are actually nodes on the stem. Sweet potatoes, on the other hand, really are roots as are beets, carrots, and turnips.

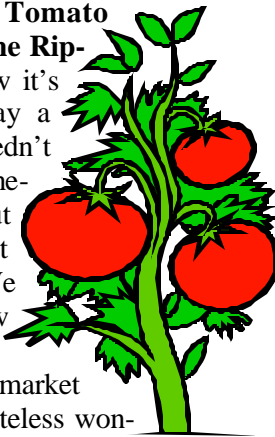
Peanuts Grow On Trees: Not true. Peanuts grow underground. Most things we think of as nuts, such as cashews, almonds, pecans, and hazelnuts do grow on trees, but not peanuts. Peanuts, which are a legume like peas, beans, and mesquite are actually the seeds of fruits. The peanut plant itself is a low growing, an-

nual plant that produces flowers on its stems. The stems then bend down and bury their tips in the ground where the peanut is produced from the (hopefully) pollinated flower. So, peanuts, potatoes, and sweet potatoes all grow under ground, but botanically speaking they are completely different parts of plants. By the way, many things we think of as nuts are actually fruits, or at least fruit seeds. From a botanist's point of view, however it can get confusing. Check this [web-site](#) for more information. Peanuts require a long summer to grow and can easily be grown in most of Cochise County.

Just to be clear, the following two "facts" might qualify as mere opinions in the minds of some folks.?

A Good Tomato Must Be Vine Rip-

ened: I know it's heresy to say a tomato needn't be vine-ripened, but it's really not necessary. We all know about the typical supermarket tomato, a tasteless wonder that ought to be illegal. We know they're picked green to aid in shipping (a green tomato doesn't get bruised like a ripe one) and ripened artificially with ethylene gas. We know that they just don't taste nearly as good as a home grown tomato. Nonetheless, all this does NOT mean that you must let your home grown tomatoes ripen fully on the vine. Once a tomato is fully ripe, it becomes more susceptible to attack by birds and insects. It also can crack as it stays on the vine. If you'll pick your



tomatoes when they are still partly green, say when they are two-thirds colored, you can defeat the critters, lessen the occurrence of cracks and sun scald, and still get a tasty tomato since the ripening process is close to done anyway. And remember, don't refrigerate tomatoes—leave them in a dry spot at room temperature out of sunlight. They'll last much longer and taste much better than if you had refrigerated them.

Vegetarians Can Enjoy Life As Much As Meat Eaters: Oh man! I love my veggies, but how can life be worth living without the occasional BLT!?

Bill Schulze, Master Gardener

Cuttings 'N' Clippings

- ☼ There will not be a Water Wise presentation in December. Watch for them to begin in January 2011.
- ☼ The High Desert Gardening & Landscaping Conference will be held February 17 & 18, 2011 at the Windemere Hotel & Conference Center in Sierra Vista. Please note that there will not be an increase in the registration fee! For scholarship information see the back page of this newsletter.

Registration forms
available in January!

Saving Rainwater—Part 2

Hot tips

Distribution - When pumping water from one tank to another, when you disconnect the pump end, if the other end is in the water, you can create a siphon and drain what you just pumped!

Hoses - If you do distribution like we do, you should consider cutting garden hoses to specific lengths so there are no curves or kinks in them for the two or three distribution jobs you do. Fewer curves means less friction which means faster pumping.

Leveling tanks and barrels - pea gravel works fine if you don't plan to move the tank. Pavers on pea gravel are better if you think you will be tipping the tank or barrel or sliding it around a little.

Pumps - pumps need electricity. Where are you going to plug it in? There are many types of pumps but the most important features to me are: 1) The ability to sense pressure and turn off or on automatically as needed. 2) A float switch is handy in some cases. We have a barrel with a pump that sits in the bottom. When it fills, the float switch turns the pump on as needed and pumps water out of the tank. 3) Garden hose sized pumps are handy for lugging and connecting but are slow. Bigger pumps can really suck the water fast so you better be ready to deal with it when the tank you are emptying runs dry or the tank you are filling gets topped up.

Tank/barrel height - Keep them low enough so you can look in them but high enough so

you can get hoses connected and fill watering cans or connect to an irrigation system. If you really need a large high tank, you really need a level gauge and better pumping solutions than we have.

Conclusion

There are lots of other things we wish we had. With new construction, get the connecting lines and power in while they are digging and thrashing about building. It's a lot harder after the landscaping is mature, especially if you are 70 years old! Here is our partial wish list:

1. A PVC pipe under the driveway to balance the water in the two 200 gallon tanks. That is, visualize where you will collect water and where you think you will use it.
2. A PVC pipe between our 550 gallon tank and the garden barrels.
3. A PVC pipe from the front to the garden so we could easily get water to the garden barrels.
4. Power outlets at each end of the garden for all sorts of uses. We would put electrical near every tank and barrel if we just knew ahead of time where those would be.
5. Filters and a hookup to the irrigation system so we could use our timers all year. The filters keep crud out of the drip system.

This all would mean we had our electrical outlets and valves handy but some are not. Again, some pre-planning would have helped immensely with our rain water harvesting efforts

Steven Fletcher. Master Gardener



4th Tri-annual Arizona Master Gardener University

What a great two days! The 29th and 30th of October 2010 were the highlight of our Fall. The varied subjects of Arboretum, Entomology and Demonstration Gardens tour were just a few of the outstanding topics presented.

The Arboretum tour was a walk back in history through the UofA Tucson campus. Our tour guide pointed out various trees, and also called our attention to the past with a discussion of how the trees were planted in their current location on the campus.

There are no bad insects-only misunderstood insects. Leave them alone and they, hopefully, will leave you alone. Entomology was a "buggin'" tour with insect displays that literally covered the walls of the Entomology office.

Our favorite site on the second day was the Pima County Demonstration Gardens located at the CEAC Head House-Campus Agriculture Center. Such a great variety of plants presented in a lovely garden setting with paths taking twists and turns into unexpected displays of plants.

We recommend the Master Gardener University to all Master Gardeners.

*Donna and Cliff Blackburn
Master Gardeners*

(Editor's Note: Master Gardener University is held at the University of Arizona Tucson Campus for eligible Master Gardeners throughout Arizona)

The Agent's Observations

Q We have started harvesting our pecan trees. Many of the nuts have some nut meats that do not fill the shell. Other nut meats are shriveled and black. What is causing this? What can be done to make sure this does not happen again?

A There usually are three causes for small or shriveled pecan nut meats. The first is caused when there is improper pollination. Pecans are wind pollinated. This year there were some late spring frosts in some areas and the male and female flowers were injured during the pollination season. Poor pollination causes nut meat not to develop properly. The second cause is very common with homeowner trees. They are not watered enough. A mature pecan tree will use 125 to 150 gallons of water a day in the middle of June. Pecans are native from East Texas through Alabama. Native trees grow in meadows or near creeks, streams, or rivers. They are heavy water users. If the trees do not get enough water the pecan meats will suffer and be smaller in size. The last reason is improper fertilizing. Pecans need large amounts of nitrogen and zinc. Nitrogen is needed for overall growth and zinc for shoot and leaf growth. If these two elements are missing,

growth will be minimized and nut meats will be small and perhaps improperly formed. For further information check this [publication](#).

Q We grew sweet potatoes this year and they did well. When we dug them this fall several had small feeding marks or "channels" on them. About 50% of the variety 'Georgia Jet' had deep cracks in them. What is causing these problems and what can be done to remedy them in the future?



A After looking at photos of the feeding marks it was determined scarab beetle grubs *i.e.* June beetles or green fig beetles, were feeding on the tubers. They consume organic matter but can eat living root tissue as well. If you can live with some cosmetic damage then treatment is not necessary. If not they can be treated with a soil applied insecticide. This will need to be done at

the proper time, normally spring, to decrease or eliminate the grub population. The deep cracking is a characteristic of this cultivar. The response from the nursery producing the sweet potato slips follows: "The grooves or cracks in the 'Georgia Jets' seems to be a characteristic of that variety. We are not sure why but they seem to crack more than others. We have not been able to prevent the cracks but manage them better by planting the 'Georgia Jets' closer together. We usually set them about 10 inches apart. This has helped with the cracking some but not stopped it. Also, a lot of rain or water toward the end of the growing season can cause rapid growth which causes cracking. The cracks do not affect the taste, just the look. Despite the cracking this variety is the most popular we sell in our area and the first choice of our family."

Robert E. Call
Area Horticulture Educator

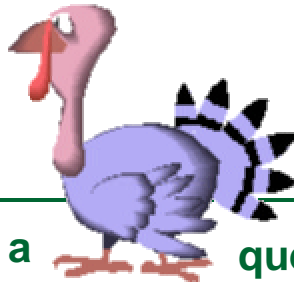
Happy
Holidays

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Have a question?

The Butterball Turkey Talk Line (800-288-8372 or talk-line@butterball.com) has operators ready to answer your turkey questions until December 31. More than 100,000 questions have been answered during November and December.

What's the weirdest question you've gotten in all your years at the talk line?

A lady from Denver who had the turkey in a snow bank—that's where she stored it and it snowed the night before and she couldn't find it. I said next year put a flag out there to help you.

-Butterball Turkey Talk Line

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 2011 High Desert Gardening & Landscaping Conference to be held at the Windemere Hotel & Conference Center, Sierra Vista, AZ, February 17 & 18, 2011. 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 — e-mail to recall@ag.arizona.edu or include disk or CD
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 UA South campus or from the Master Gardener [website](#).
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 14, 2011.

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 28, 2011 and their names published in the February 2011 Master Gardener Newsletter.