How Does Your Garden Grow?

News from UCCE Calaveras Master Gardeners

July 2014

From The Editor

As they say in England when the temperature hits 68,'Phew what a scorcher!'. This edition features tips on dealing with this hot July weather as well as an extremely well-researched article on soil and a guide to optimizing your tomato crop.

Those of us in CCWD already have water restrictions in place and the aquifer in Valley Springs is in a precarious situation. It's the same story in much of the county, so let's all do what we can to use water wisely.

We welcome your feedback. Please email calmastergardener@gmail.com.
Happy Gardening,

Odile Morrison
President,
Calaveras Master Gardeners

In This Edition

Soil

By Veda Scherer, *University of California Cooperative Extension Master Gardener for Calaveras County.*

A version of this article appeared in the Calaveras Enterprise on 3 July, 2014. It will also be a handout at Open Garden on October 25.

Soil is more than just something to hold your plants upright. It is a super organism that is home to the most populous community on the seven continents. Ninety percent of all organisms live underground. There can be 10,000 to 50,000 species in less than a teaspoon of soil. There are more microbes in that teaspoon of soil than there are people on the Earth. Real soil is active, alive and moving. Critters are everywhere, doing interesting things and many of them – bacteria, fungi, protozoa and nematodes – are invisible to the naked eye.

The common denominator of all soil life is that every organism needs energy to survive. Most organisms need to eat something containing carbon to get the energy they need. Carbon may come from plants, waste products produced by other organisms or the bodies of other organisms. It is an eat-and-be-eaten world in and on the soil. Read More..

Upcoming Events

Online Calendar

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Need Advice?

Master Gardener Helpline
209 754 2880

Ask a Question

Open Garden July 26

10am - 2pm
Demonstration Garden
Govt. Center, San Andreas.

Topic: Beat the Heat

Garden To Do List for July

By Teresa Spence, *University of California Cooperative Extension Master Gardener of Calaveras County.*

- The weather is usually hot and dry this time of the year. It is important to make your home fire-safe.
- Clear debris from your roof and gutters.
- Prune off any limbs from trees that are within 15 feet of your house.
- Creating a "Defensible Space" of 100 feet surrounding your house is critical to help save your home from a wild fire:
    - Clear a zone of flammable vegetation 30 feet around your home.
    - Mow weeds and thin out shrubs for at least 70 additional feet surrounding your house
    - Remove fuel ladders (bushy shrubs that are close to tree branches) from around trees.
- Mow with care, only in the cool of the morning; use a string type mower if possible since regular mowers can cause a spark.
- Relocate woodpiles away from your home; clean up any dead vegetation and grass.
- In hot weather it is important to water container plants often; check soil moisture daily.
- Watch out for signs of coddling moth larvae: reddish/brown frass on apples and pears.
- Remove and destroy the fruit from the tree; pick up and destroy any fallen fruit.
- Water in the morning to minimize evaporation.
- Use a lot of mulch around your shrubs and trees to keep them cool and to conserve moisture.
- Continuously deadhead repeat blooming roses.
- Water ornamental trees deeply each month until the rains arrive; avoid watering established native oaks or drought tolerant trees.

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Plants take up nutrients through their roots to feed their leaves. The photosynthesis in their leaves is then used to produce chemicals, known as exudate, which they secrete through their roots. Root exudates are in the form of carbohydrates and proteins. Their presence in the soil wakes up, attracts and grows specific beneficial bacteria and fungi that subsist on these exudates and the cellular materials sloughed off as the plant's root tips grow. All this takes place in the zone immediately around the roots. This zone contains bacteria, fungi, nematodes, protozoa and even larger organisms, such as earthworms and beetles.

Soil bacteria are like small bags of fertilizer, retaining in their bodies nitrogen and other nutrients they gain from root exudate and other organic matter. The soil protozoa and nematodes act as fertilizer spreaders, releasing the nutrients locked in the bacteria and fungi by eating them. They digest what they need to survive then excrete carbon and other nutrients as waste in the root area of the plant. Soil life provides the nutrients needed for plant life, while plants fuel the cycle by producing exudates. The protozoa and nematodes are, in turn, eaten by insects, spiders and arthropods – animals with segmented bodies, jointed appendages, and an outer covering called exoskeleton. Soil arthropods also eat each other and are the food of snakes, birds, moles and other animals.

The soil is one big food restaurant. These organisms create soil structure: bacteria produce slime in order to stick to things so they won't wash away; fungal hyphae travel through soil particles, sticking to them and binding them together, thread-like, into aggregates. Worms, insect larvae, moles and other burrowing animals move through the soil in search of food, creating pathways that allow air and water to enter and exit. This soil food web not only provides nutrients to the roots, it also helps create soil structure.

Not all soil organisms are beneficial; a large and diverse soil community controls troublemakers. If the soil food web is a healthy one, the competition keeps the pathogens in check. A healthy soil food web won't allow one set of its members to get so strong as to destroy the web. Read more..

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Special soil fungi, called mycorrhizal fungi, establish themselves in a symbiotic relationship with roots, providing them not only with physical protection but with nutrient delivery as well. In return for exudants, these fungi provide water, phosphorus and other necessary plant nutrients. Chemical fertilizers negatively impact the soil food web by killing off entire portions of it. Once the bacteria, fungi, nematodes and protozoa are gone, other members of the food web disappear as well.

Earthworms, lacking food and irritated by the synthetic nitrates in soluble nitrogen fertilizer, move out. Since they are major shredders of organic material, their absence is a great loss.
As soil structure deteriorates, watering can become problematic; pathogens and pests establish themselves and gardening becomes a lot more work. If the salt-based chemical fertilizers don't kill portions of the soil, rototilling will. Rototilling breaks up fungal hyphae, decimates worms, and rips and crushes arthropods. It destroys soil structure and saps the soil of necessary air. Air pollution, pesticides, fungicides and herbicides also kill off members of the food web community or chase them away. Compaction also destroys the soil food web by compressing the animal habitat and ultimately the habitat of soil microbes and the plant roots they depend on for nourishment.
So what's a gardener to do? Compost can be used to inoculate beneficial microbes and life into the soil around your yard. Some plants (trees, shrubs and perennials) prefer soils dominated by fungi. Coarse, dry, aged brown organic materials support fungi as does mulch laid on the surface. Other plants, such as vegetables, annuals and grasses, prefer bacterially dominated soils and fresh green organic material worked into the soil. Avoid additives that have high NPK numbers, rototilling, or compacting your soil beds by walking on them. These activities destroy or severely damage the soil food web.

Coming Events

July 26
Open Garden 10am - 2pm
Topic: Beat the Heat (mulching, shade cloth and other methods)
August 23
Open Garden 10am - 2pm
Topic: Preserving Fruits & Vegetables.

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Kids Day May 2014

Kids Day was a great success. Over 200 people attended. We asked parents to rate the event. Out of 50 responses all said the event was great. We had many Master Gardener volunteers. It was also fun to have the kids from the Junior Master Gardener program involved. They sold veggie plants and the money received was donated to them for their program.

Free Publication on Growing Tomatoes

It's the time of year Master Gardeners are likely to field a lot of questions about tomatoes. The free ANR publication ' Growing Tomatoes in the Home Garden' (ANR Publication 8159) is a great resource.

This publication provides research based information for home gardeners on choosing varieties best suited to your region, disease resistant varieties, plant support, water and fertilizer issues, abiotic disorders and pests. Get the PDF here

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