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The Curious Gardener

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Snails and Slugs

by Laurie Meyerpeter, Nevada County Master Gardener

Did you know that there are hundreds of native snail and slug species in California? Don't worry, the vast majority of these aren't going to ravage your lettuce seedlings. Most are nearly microscopic and many are carnivorous! These tiny mollusks play an important part in the ecosystem, devouring all sorts of organic material such as bird droppings, fungi, fallen leaves, tiny plant pieces, small dead organisms, dog poop, and a myriad of other organic material. Some hunt and eat live prey including other tiny snails. Many of these tiny snails and slugs are largely unknown to science, and their miniature world is as mysterious and unfamiliar to us as stars in distant galaxies or the dark depths of the deepest oceans.

There is another snail world that is much more familiar to us. The brown garden snail is an introduced species originally from the Mediterranean and Western Europe. It is so invasive and destructive in this state that if California were to elect an official "state pest," most gardeners would nominate this snail. The brown garden snail, (*Cornu aspersum* formerly known as *Helix aspersa*), was introduced in the mid 1800's, quickly escaped, and has been wreaking havoc in gardens and crops throughout the Golden State ever since.



Tiny native snail. Photograph by Mary Meyerpeter. All rights reserved.

In addition to snails, there are a number of slugs that cause damage in our gardens. Not surprisingly, many of these are introduced species as well. Those slugs devouring your marigolds are largely species from other places in the world.

By now most readers are thoroughly repulsed and thinking of slimy mucous trails and chewed-up, irregular holes in plants and ...REVENGE!!! Poison, aka "snail bait," comes to mind, right? Wrong. In most situations, poison is the least useful method of control. In addition, many snail baits are extremely poisonous to children, pets and wildlife. Poison disrupts that tiny and necessary ecosystem

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Gardener's Companion 2015 Calendar Available Now



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Calendars are available at Placer County Master Gardeners events, can be purchased from local vendors, or ordered online or by mail.

See the calendar website pcmg.ucanr.org/2015_calendar for more details.

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in your garden as well. And it may not stay in your garden; irrigation containing small amounts of pesticides from our landscapes runs off into the streets and drains and eventually into our creeks and rivers.

But most relevant, snail bait is simply NOT the most effective way of dealing with slugs and snails. We tend to think that our landscape pests start and end at our own garden gate. Just for a moment, imagine yourself high above your neighborhood and then imagine an army of invasive snails and slugs in EVERY backyard! Killing the snails in your backyard simply opens up free territory for the snails next door. You'll be applying snail bait forever. The problem will never go away unless every inch of your neighborhood is treated with poison. Snail bait works best in limited areas for specific purposes only.

The best methods of managing garden-devouring mollusks are environmental or habitat modification and changes in watering practices. Change your backyard from the "Ultimate Snail Condo Complete with Food Court" into an absolutely miserable place for them to live. Their preference is a backyard with delicious leafy food, moist conditions, and lots of hiding places, such as the typical well-irrigated, suburban backyard. Change your backyard into a clean, dry, beautiful yard using good maintenance and drought-tolerant plants available at any nursery and you will largely eliminate slug and snail damage in your garden. In addition, your yard will be safer for your kids and pets, and more environmentally friendly to everything from tiny carnivorous snails in our soil to salmon in our rivers to birds in our skies.

The U.C. Davis IPM website, <http://www.ipm.ucdavis.edu/PMG/PESTNOTES/pn7427.html>, is filled with detailed instructions on how to change the environment to make it unfriendly to snails and slugs. It contains information on good garden practices include cleaning up the garden and eliminating hiding places, avoiding snail magnet plants and substituting snail resistant ones, and isolating vulnerable vegetable gardens. Change to drip irrigation if possible. Water in the morning ONLY (studies show that watering early in the morning is, by itself, as effective as using snail bait and watering in the evening!). Trap those pesky snails and dispose of them! Use copper barriers as appropriate.

Avoid using snail bait unless absolutely necessary, and then choose one of the products containing iron phosphate over the more harmful but less effective metaldehyde baits. Snail bait should be used only in conjunction with some of the other management methods.

Managing the snail and slug population in your yard using primarily environmental modification in conjunction with other supporting methods has many benefits. You won't get frustrated by the reviled snails or repulsive slugs eating the lettuce in your garden. Your yard will be cleaner and harbor fewer other pests and diseases. You may have new and better plants in your yard, plants that are ultimately better adapted to this area. You'll use less water. Your children and pets will be safer. And you will be making a contribution to the well

being of the world around us, the fish in our local creeks, the sandhill cranes that fly overhead on their yearly migrations, the finches and hummingbirds at our feeders, and those tiny native snails and slugs beneath our feet.

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Out of the Ordinary: Unusual Fruit Bearing Trees and Bushes Worth a Try

by Mike Kluk, Nevada County Master Gardener

Do you feel like you are in a peach, apple, strawberry rut? There are thousands of other fruit bearing trees and bushes that can provide beauty and interest to your garden and a bit of food as well. This article will look at three trees and three bushes that are adapted to our foothill soils and climate. Some are available at local nurseries, some you will need to order. All are worth consideration if you are willing to experiment with a tree or bush not commonly grown here.

Serviceberry (*Amelanchier arborea*)

The serviceberry is related to the Saskatoon of Canada. Unlike its taller relative, it is a bush that seldom grows more than three feet high and wide. It has multiple monikers including juneberry, shadbush, shadblow and sarvisberry. The serviceberry grows wild across Canada and in most states in the continental United States, including portions of California. It is often described as a “substitute” for blueberries but produces worthy fruit in its own right. It is not a true berry but a pome fruit being in the same family as apples and roses. Unlike blueberries, serviceberries do not require highly acid soil, but will tolerate our foothills soils just fine. They are more cold hardy than the high bush blueberry commonly grown.

Serviceberries have an abundance of white flowers in the spring and do not seem at all bothered by late frosts. The berries ripen primarily in June but can stretch into July. Berries of most cultivars are blue to black. They are sweet, especially when allowed to ripen fully. The plant also puts on a pretty show of red leaves in the fall. It would be an excellent fit in a natural edible landscaping design. They tolerate full sun but can handle and even benefit from partial shade in our climate. Serviceberries adapt to a variety of soils but avoid areas that saturate regularly.

Like other pome fruit, serviceberry is susceptible to fire blight and rust although not to the extent of most apples. Insects do not appear to be a problem. Birds can strip an entire crop however.

Aronia Berry (*Photinia melanocarpa*)

If you frequent health food stores, you are probably familiar with the many products made from antioxidant-rich aronia berries. Aronia is a deciduous woody shrub that is easy to grow. It is tolerant of heavy, poorly drained soils although it will do better in soil that does not saturate for long periods. It grows well in acidic to mildly alkaline soils and is drought tolerant but giving it plenty of water is said to improve the flavor of the fruit. Aronia bushes grow wild at the edge of forests and can flourish in full sun or partial shade. They are hardy to USDA Zone 3. They put off blooming until May so avoid most frosts and seem to take the sneaky late ones in stride. At maturity, the aronia bush can reach six feet in diameter and almost as tall. It will produce approximately 15 pounds of berries. It can be pruned to be a much more compact plant. Wood that is over four years old should be removed to increase production.

Another name for aronia is black choke berry. Those antioxidant properties do come with a price and the berries tend to be astringent. Some people like to eat them fresh but they are often blended with other fruit or cooked. The berries can be dried, used as part of a juice mix or in baking, jams and salsa; all of which reduce the astringency of the fresh berries.



Aronia berries.

Photo by Kortne Phillips, Placer County Master Gardener

Aronia bushes bloom in the early spring and are covered with a profusion of blossoms. The berries are approximately 1/4 inch in diameter, dark blue to black and borne in clusters in September. Aronia bushes are self fruitful. They are in the same family with roses and apples, rosaceae, so these “berries” are also a pome. Like apples and roses, they can be susceptible to rust and possibly other diseases that affect that plant family. The most popular cultivars are Nero, Viking and Morton.³

Goumi (*Eleagnus multiflora*)

This relatively large shrub is less well known than its genus cousins, Russian and autumn olive, but produces superior berries that are pleasantly tart and juicy. As a member of the genus *Eleagnus*, it offers the added bonus of being a “nitrogen fixer,” forming a symbiotic relationship with nitrogen fixing bacteria in the soil. It will grow to eight feet high and wide but can be kept in check with pruning. Goumi blossoms profusely in the early spring. The flowers are not particularly showy but have a wonderful scent. In fact, in ancient

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Persia, the scent was said to be an aphrodisiac. That has so far gone unconfirmed in Nevada County. Goumi are partially self fruitful but benefit from cross pollination.

This is one tough plant that will grow well in a variety of poor soils and is very drought tolerant once established. Plants of the *Eleagnus* genus are often used to reclaim strip mined or otherwise abused lands. The leaves are leathery but have a silver underside that makes them very attractive fluttering in a light breeze. The plant will easily tolerate foothill winters being hardy to USDA Zone 4. It handles full sun but in our intense summers, can do with a little afternoon shade. It is a relatively fast growing plant. Goumi are generally not affected by any disease or insect pests.



A delicious juice can be made from goumi berries.

Photo by Kortne Phillips, Placer County Master Gardener

Jujube (*Ziziphus jujuba*)

The jujube is a small deciduous tree that is commonly known as Chinese date. It is native to Eastern China and is a Chinese import you will appreciate. It just may be the single best fruiting tree for our fickle foothills weather. The jujube breaks dormancy and blooms late, avoiding sneaky spring frosts and is tough enough to take even a late “May freeze” in stride. It is drought tolerant and well adapted to our long hot summers. It does not seem to be fussy about pH or deterred by heavy foothill soils.

The jujube is an attractive small tree with shiny light green leaves. It only needs pruning to remove dead branches. The fruit is small, approximately one to two inches in diameter. It turns from light green to a burnished brown. When most of the fruit surface has become brown, it is at its sweetest and juiciest. The flavor is reminiscent of a sweet

apple with “earthy undertones.” The jujube is unique in that, if left on the tree, it will dry in place, becoming much like a date. It slowly becomes wrinkled and spongy while retaining most of its sweetness.

Hundreds of jujube cultivars are available in China where it is a popular and important food crop. Only two cultivars are commonly available here, Lang and Li. Li is somewhat larger and is self-fruitful but is reported to be even more productive if a Lang is present. Lang needs a Li in the vicinity to produce. Li ripens somewhat later than Lang so having one of each may not be a bad idea.

Nanking Cherry (*Prunus tomentosa*)

This is another fruit with a Chinese name, although is most commonly grown in Russia. It is a true *Prunus* but hails from cold semi-arid regions and has developed a toughness to match its environment. The fruit is about a half inch across with a tart cherry flavor. The small tree will grow 9 to 15 feet tall and just as wide. Also known as downy cherry, its leaves have a soft, fuzzy appearance. The tree does tend to grow a thicket of branches and will benefit from a thorough pruning and thinning.

Nanking cherry blossoms early, at about the same time as apricots. But unlike apricots, it is able to set fruit despite blooming when frost is settling. It puts on quite a show with every branch covered with white blossoms while most trees are still in deep slumber. That alone is reason enough to give this tree a try.

Most cultivars require a pollinator although self-fruiting versions are available. Finding a spot for two of these pretty little trees should not be a big challenge. In fact, it is often sheared as a hedge so you can try a whole row.

The tree is potentially subject to all of the pests of other *Prunus* species including borers and brown rot. It is, reportedly, less susceptible than the more popular peaches and cherries however. No information was found regarding whether bacterial canker or blight is a problem, which can affect trees in the same family. The author has, however, lost a few neighboring trees to that disease and the Nanking cherry is still standing.

Nanking cherry does not like saturated soil, so find a spot with decent drainage. Acid soils do not seem to be a problem. Given adequate conditions, it will grow quickly, often 2-3 feet a year. It is long lived for a fruit tree with many specimens lasting 50 years.

Mulberry (*Morus alba*, *Morus rubra* & *Morus nigra*)

The mulberry does not receive the respect it deserves as a fruit producer. Because fruitless cultivars have become so popular, the fruiting varieties have been lost in the background. Admittedly, you would not want to plant a fruiting mulberry over your driveway or walkway. The dark colored fruit will stain and was used as a source or dye in medieval times. But in the right spot, it will form a stately shade tree and produce enough juicy sweet berries to satiate a small army of birds and leave plenty for you.

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Mulberry trees are often very late to bud out and flower. This is a good trait in our area. Even so, the young trees are not particularly hardy once they have broken dormancy. Select a warm spot in your yard or cover the tree for the first few years if a late frost is predicted. More mature trees are able to handle frost better. Even if buds are killed by frost, mulberries can fruit from secondary buds.

Three main species of mulberries grown worldwide; white, red and black. There are hundreds of cultivars for each. We will only consider white and red mulberries because the black, even though the most common, is the least cold hardy. White mulberries originally came from Russia and are the most cold hardy. "White" refers to the light green of the leaves. The fruit can range from light green to black, depending on the cultivar. New American and Wellington are popular cultivars. The red mulberry is the largest of the three species. It is native to the United States, originally ranging from the East Coast to Nebraska. The color of the fruit can vary from red to black. The most common cultivar grown in the United States is Illinois Everbearing.

Mulberries need full sun and lots of room. Plan for a mature tree to spread at least 20 feet. A mulberry will produce a huge amount of fruit that can be eaten fresh, baked into pies, pureed, made into a pudding or dried.

If the plant you want to try is not available locally, you can order it over the internet. Here are three on-line sources with a good selection of uncommon fruit bearing trees and bushes:

Hidden Springs Nursery

www.hiddenspringsnursery.com

Burnt Ridge Nursery

www.burntridgenursery.com

Rain Tree Nursery

www.raintreenursery.com

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- http://www.agmrc.org/commodities_products/fruits/aronia-berries-profile/
- Uncommon Fruits Worthy of Attention, Lee Reich, 1991
- Growing Unusual Fruit, Alan Simmons, 1972

Insect Trivia Quiz


by Bonnie Bradt,
Nevada County Master Gardener

1) Which of these are insects?

- a) Mites
- b) Spiders
- c) Grasshoppers
- d) Shrimp
- e) All of the above

2) Beetles are one kind of insect. You know some of them well—ladybugs, fireflies and dung beetles are all beetles. How many species of beetles have been described?

- a) 200
- b) 2000
- c) 100,000
- d) 350,000



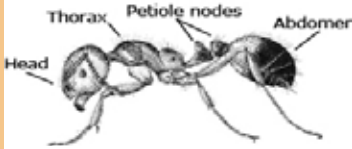
Predaceous ground beetle

3) True or False – Caterpillars are insects

- a) TRUE
- b) FALSE

4) Only one of these statements is TRUE of ALL ants. Which one?

- a) They have a bend in their antennae.
- b) They are wingless.
- c) They have 8 legs.
- d) They can't sting.



Learn to identify common household ants at www.ipm.ucanr.edu/TOOLS/ANTKEY/

5) True or False – a butterfly will die if you touch it's wings.

- a) TRUE
- b) FALSE

See answers on page 9



Berberis aquifolium, Oregon Grape

by Lynora Sisk, Placer County Master Gardener

Last year the Placer/Nevada County Master Gardeners visited the UC Davis Arboretum. We were completely in awe and wanted to let folks know what a jewel we had discovered! The Arboretum highlights plants called the UC Davis “All-Stars.” These are plants that have been tested in the Arboretum and are “easy to grow, don’t need a lot of water, have few problems with pests or diseases, and have outstanding qualities in the garden.”¹ They also include many California native plants.

One of the California native plants featured at UC Davis Arboretum is the *Berberis aquifolium* ‘Compacta’. This plant, commonly known as the compact Oregon grape, is intriguing because of its beautiful yellow flowers that bloom in the winter/spring providing nectar for hummingbirds and other beneficials. Then in the fall it produces dark, grape-like fruits that provide food for birds such as robins, finches and towhees. The fruit can also be used for making jelly or preserves. This plant is a shrub with a low spreading habit of up to 5 feet and will only get about 1 to 2 feet tall. It needs little or no pruning and likes part shade to shade. Perfect for growing under oaks, not only for the shade but for its low water needs.

Below are a few fun facts about the Oregon grape from the Native Plant Society of Oregon Kalmiopsis².

- It was designated the Oregon State flower in 1899.
- Meriwether Lewis (Lewis and Clark expedition) discovered the species in 1806

along the Columbia River.

- Native Americans used the roots for yellow dye in woven materials such as baskets.

When you get a chance, take a look at the UC Davis Arboretum website for more information on their “All-Stars.” We’ll feature another “All-Star” in our next issue.

References:

- ¹ UC Davis Arboretum website http://arboretum.ucdavis.edu/arboretum_all_stars.aspx
- University of California Sonoma County Master Gardeners, “Native Berberis” by Barbara Kirbach
- ² Native Plant Society of Oregon, Kalmiopsis Volume 13, 2006, Shannon Fillhart and Tobias Polichas

Looking to Buy Arboretum All-Stars?

The Friends of the UC Davis Arboretum hold plant sales at the Arboretum Teaching Nursery several times a year. Upcoming Fall sales are as follows:

October 11, Members-only from 9:00 to 11:00 am (you can join at the door); the general public is admitted from 11:00 am to 1:00 pm.

October 25, Open public sale from 9:00 am to 1:00 pm.

For more information, go to http://arboretum.ucdavis.edu/plant_sales_and_nursery.aspx

Soil Microbiology

by Carol Feldman, Placer County Master Gardener

The ever-increasing popularity of organic gardening has left many people trying to understand what it is and how to do it. Using organic products is a good start, but to understand what to avoid and why, we need to dig a little deeper, into the soil. In this article we explore one of the most important principles of organic gardening, soil microbiology and the soil food web.

What Is A Soil Food Web?

What do soil biologists mean when they say “soil is alive”? It’s not actually alive so much as a habitat for a diverse range of living organisms, mostly microscopic in size. Healthy soil is full of these microorganisms, such as bacteria, fungi, protozoa, etc., and they are all chasing down and eating food. They are alive with activity and this is what’s known as the soil food web.

Why Is It Important?

Each member of the soil food web needs to eat to stay alive, and after digesting their food, they put out waste. This cycle of eating and putting out waste recycles organic matter into nutrients that plants can then take up.

In addition, the movement of microbes through soil creates channels, which increases water flow, and once the microbes eat, the nutrients are held in their bodies so they are not leached out of the soil when water runs through. Microbes also build protective surfaces around plant roots that protect them from pests. And, many microbes are responsible for breaking down pollutants and toxins.

How Does It Work?

Soil is basically rock that has decomposed into particles over the millennia, mixed with humus (stable organic matter) from organisms that have died in and around the soil. These particles contain the nutrients plants need.

Once a plant seed has germinated and roots develop, the roots absorb nutrients from the surrounding soil. The content of the soil determines the health of the plant, and this is why gardeners say you should “feed the soil” and let the soil feed your plants.

Plant roots also put out substances that attract bacteria and fungi. Bacteria and fungi are called primary decomposers because they ingest waste, like the organic matter in the root zone. Then a whole host of secondary decomposers, like earthworms, protozoa and nematodes, eat the bacteria and fungi and release nutrients like nitrogen in a plant-available form. Many of these organisms attract and feed more microbes, which produce more nutrients, and so on, completing the cycle of recycling!

Yes, there are harmful bacteria and fungi in soil, but in a healthy plant environment, there are enough beneficial microbes to keep the harmful microbes under control by competing for food and exuding enzymes.

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There are over 250 species and varieties of *Eriogonum*, or Buckwheat, in California, making it the largest genus of the state’s native plants.

Ranging from small herbs to large shrubs, both annual and perennial, most are drought-tolerant and easy to grow. They have prolific flowers that are important food sources for bees, butterflies and beneficial insects.

Did You Know ?



Photos: Top, *Eriogonum giganteum*, an Arboretum All-Star. Photo from UC Davis Arboretum website.

Bottom, *Eriogonum umbellatum*. Photo by Elaine Applebaum

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From bacteria and fungi to protozoa, nematodes, worms and arthropods, this intricate web can be a gardener's gold mine. But it's a fragile ecosystem, and is easily destroyed by salts, chemicals and compacting or over-working the soil.

How Do We Ensure A Healthy Soil Food Web?

One element of a healthy soil food web is diversity in life forms. Different microbes eat different food. Some eat organic waste; some eat other microbes. So a wide variety of microbes are needed to recycle a wide variety of nutrients.

What attracts a variety of microbes? Organic matter: waste, in the form of kitchen scraps, grass clippings, fallen leaves, manures, etc. The inputs and outputs of your compost pile attract and feed microorganisms. That's why compost is called "Gardener's Gold" because it builds a healthy soil food web.

Using organic mulches and incorporating cover crops (green manures) also attract and maintain a healthy soil food web. So whether you apply a thick layer of compost as a top dressing, chop down cover crops, use organic mulch, or all three, you'll attract and feed the microbes you need for healthy soil.

Litter like grass clippings and fallen leaves are not only full of nutrients ready to be recycled, they are foods that keep microbes alive. So either compost the litter, or leave a thin layer in place. A heavy wet pile may rot, and a dry pile may attract unwanted pests like rodents.

Also, try not to disturb this ecosystem. A light tilling once a year will do some, but only minimal, harm to your soil food web, and added organic matter can compensate for that by adding back live microbes ready to start recycling again. More frequent tilling may kill off microbe populations and will take longer to recover from.

Soil compaction, from running heavy equipment over the soil or walking on your soil while it's wet, can crush and suffocate microbes. Similarly, salts in chemical fertilizers kill microbes by drying them out. So take pity! They're the good guys!

Don't Plants Need Fertilizer?

Sometimes. Some plants need more nutrients than your soil has at that moment. Some are "heavy feeders" and always need a boost; others just need a boost to get started. Get to know your plants' nutrient requirements before deciding to fertilize.

There are many organic fertilizers that feed slowly and gently while continuing to build your soil health. Look for products with low NPK ratios (nitrogen, potassium and phosphorus); the numbers on the package should add up to less than 15. Also look for

natural ingredients like bone meal, blood meal, kelp meal, fish emulsion, bat guano, etc.

Avoiding Chemicals

Other ways to protect the soil food web and ensure healthy soil is to practice Integrated Pest Management (IPM). IPM is an approach to pest control that emphasizes natural solutions, avoids the use of pesticides if possible, and relies on least toxic ones if pesticides are warranted. Among the basic principles of IPM are:

- Preventative measures, such as choosing the right plant for the right place.
- Cultural controls, including pruning, crop rotation and companion planting.
- Least toxic solutions, for when treatment is required. These include:
 - biological controls (such as attracting or releasing beneficial insects)
 - mechanical controls (such as hand-picking or a hard spray of water)
 - least toxic pesticides, starting with organic products like horticultural oils and soaps

If chemical pesticides are necessary, be careful when choosing products. Keep in mind that most chemicals will kill those all-important, friendly little microbes! Check that the product specifically addresses your pest, and find out just how toxic the product is.

Finally chemical treatments can result in resistance to the chemicals being used. After treatment, only the insects and diseases that are resistant to that chemical are left to reproduce! Yikes! This logically leads to the use of more toxic solutions. And, because beneficial microbes and insects are destroyed along with harmful pests, those resistant pests can then re-emerge successfully without the beneficials to control them.

Avoid this unsustainable cycle of more chemicals and greater expense; try to avoid chemical treatments and support your local soil food web!

In Conclusion

So, if you've been thinking about making the switch to organic gardening, or just incorporating a few principles into your practices, protecting the soil food web can be a valuable tool. Encouraging its health by adding organic matter will give you many benefits, including better access to plant nutrients, increased plant protection and a better ratio of good to harmful microbes.

As the old saying goes, "no one ever fertilized an old growth forest." Let nature help out with your garden chores, and you may just save time and money as you achieve that beautiful garden!

References:

- **Teaming with Microbes**, by Jeff Lowenfels and Wayne Lewis, Timber Press, 2010.
- **The Gardener's Guide to Common-Sense Pest Control**, by William Olkowski, Sheila Daar, Helga Olkowski and Steven Ash, Taunton Press, 2013.
- **10 Steps to Gardening with Nature**, by Carole Ann Rollins, PhD and Elaine Ingham, PhD, Gardening with Nature, 2011.

Drip Systems Save Water and Reduce Weed Growth

By Vic Biswell, Placer County Master Gardener

Drip irrigation is a water distribution method, which was actually used in ancient times to efficiently deliver water to crops using buried pots with drip holes on the sides. Today drip, also called micro-irrigation technology, uses plastic pipe, calibrated emitters, and micro sprays to carry a controlled flow of water, under low pressure, directly to plants and trees.

Drip irrigation has multiple uses in horticultural activities. Besides typical landscape applications, it can be used with raised beds, containers, and even window boxes. It is a major facet in sustainable and edible landscapes.

Drip systems need not be a big mystery to install, especially if you are willing to start small, experiment with different emitters, and monitor your system output on a regular basis. This can be a creative experience for you—as well as promoting healthy plants.

A beginning drip application requires the appropriate components, a layout plan, and basic installation techniques, all of which are described in “Drip Irrigation in the Home Landscape,” UC Agricultural and Natural Resources Publication #21579. This booklet also describes trouble shooting and guidelines on how much to water. Information can also be obtained from retailers in Placer and Nevada Counties that cater to drip enthusiasts.

You will indeed save water and its associated cost when you install this irrigation system. The drip method exceeds 90% efficiency in delivery of water whereas typical sprinkler systems are 50 to 70% efficient.

Drip systems do more than save water; they also enhance plant performance by eliminating weed growth because they deliver water only to the designated plant or tree. Weeds can harbor insects that you might not want in your garden and they are usually an eyesore.

These systems are also highly adaptable and can be easily used for almost all plants and trees. Expansion to irrigate additional plants and/or plants in tight spaces is easily accomplished. People with busy lifestyles can automate the system using an AC or battery powered controller.

The main disadvantage is that drip systems require regular maintenance to ensure that the emitters and micro sprays do not get clogged with water particulates. Also, use of drip technology to water lawns is limited and expensive.

However, regular monitoring of the drip system can be a big advantage to your entire garden. It puts you in the garden where you can experience all the interesting events that occur there over the season.



Answers to Insect Trivia Quiz:

- 1) **c)** Grasshoppers are the only insects in the group. Mites and spiders, ticks, centipedes, shrimp, crabs and lobsters are all “arthropods” or jointed-legged creatures, but none of them belong to Class “Insecta”, the 6 legged arthropods.



Adult Devastating Grasshopper

- 2) **d)** 350,000 species. However that was maybe a few days ago, so there are more by now. Beetles are incredibly numerous and account for about a quarter of all the described species on Earth. Not just a quarter of all the insects... a quarter of ALL kinds of animal species. Giraffes, cats, warhogs, everything.

- 3) **a)** TRUE. Caterpillars are juvenile life stages of a butterfly or moth. They eat and eat and then wrap themselves up in a cocoon where they actually (and I know this is totally weird, but true) break themselves down and reform themselves into an adult that looks totally different than the caterpillar that started out. Very cool.



Cabbage Looper Larva

- 4) **a)** Ants have a bend in their antennae. All of them. They have only 6 legs, the adult reproductives have wings, and many ants CERTAINLY are capable of stinging. Fire ants are the first example that springs to mind. But some other ants have stingers as well as jaws to get their POINT across (get it?)
- 5) **b)** FALSE Butterflies are actually tougher than they look. Don't manhandle them or anything, but they lose scales every day in their daily challenge of living in the world.

Have insect pest questions?

Find answers and management strategies at www.ipm.ucdavis.edu/PMG/menu.homegarden.html

Photos by Jack Kelly Clark,

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Q & A

by Trish Grenfell, Placer County Master Gardener

There are many theories out there and even universities differ slightly in techniques. Basic guides are included here.

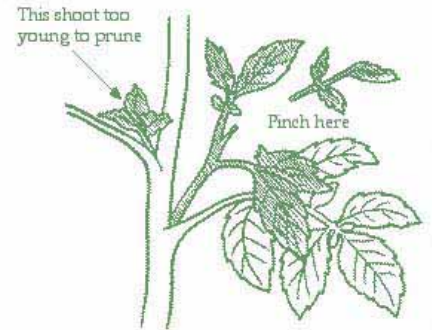
Why prune? From the University of Illinois Extension: "Pruning is the removal of small shoots that join the stem. This reduces competition between the suckers and the fruit. Pruned plants produce larger and earlier

Two experienced gardeners in my garden club prune their tomato plants.

What is the benefit and how should I do it?

fruit as most of the plant energy is channeled into the fruit." In general, more stems means more but smaller fruits, which are produced increasingly later in the season.

A sucker is a small stem that is growing between the main trunk and stem of a tomato. It is usually growing at a 45 degree angle. Remove a sucker (See photo.) by taking it between your thumb and 2nd finger and bending it to the side until it breaks. UC Davis advises to wait until the sucker has two leaves and pinch off just beyond those first two leaflets. The advantage of this method is that there is more foliage left for photosynthesis (food production) and better leaf cover to help protect the developing fruits from sun-scald. It will be necessary to check your plants weekly for sucker development.



The number of large stems you retain on your tomato plants depend on (1) whether your plants are determinate or indeterminate and (2) how you keep your plants off the ground.

Pruning is more critical in indeterminate tomatoes than determinate ones. Determinate varieties have short- to medium-length branches and are not heavily pruned since they are self-topping, growing to a genetically pre-determined size and then stopping. All of the blossoms and fruit on a determinate tomato develop at the end of growing tips at about the same time. Some horticulturists instruct us to pinch all suckers from the ground level to the first flower cluster, as these stems are not productive. Others say don't prune anything. Your choice.

Indeterminate varieties are heavily pruned when trellised, moderately pruned when staked, and lightly pruned when caged.

Caged plants generally are pruned to four or five main fruiting branches. You choose the best stems to keep. As plants grow, keep turning ends of the remaining branches back into the cages.

Limit staked indeterminate plants to two or three fruit-producing branches. A popular method is to select the main stem, the stem that develops immediately below the first bloom cluster (a very strong stem), and one other stem below that. Remove all other suckers.

Trellising is only for indeterminate varieties. Prune to just the main stem, or occasionally to the main stem plus one strong stem originating just below the first bloom cluster.



Photo by Janice Miller,
Placer County Master Gardener



Events Calendar

Nevada County Demo Garden

1036 W. Main St., Grass Valley (on NID Grounds)

Placer County Demo Garden

11477 E. Ave., Auburn (Senior Garden, DeWitt Center)

September

September 20

8 am-Noon

Visit the Placer County Master Gardeners at the Auburn Farmers' Market

Old Town Courthouse Parking Lot

September 20

10am-noon

What to Grow Under the Cover of Native Oaks

Nevada County Demo Garden

Tuesdays, Sept. 23, 30

8:30 am-1:00 pm

Visit the Placer County Master Gardeners at the Roseville Farmers' Market

Whole Foods Market at Fountains

September 26-28

Visit the Placer County Master Gardeners at the Fall Auburn Home Show

Fri. 11:00 am-6:00 pm

Sat. 10:00 am-6:00 pm

Sun. 10:00 am-5:00 pm

Gold Country Fairgrounds

1273 High St., Auburn



Nevada County events
in green boxes



Placer County events
in yellow boxes

Nevada County Master Gardeners Fall Plant Sale

September 27

9:00 am-Noon

Don't miss out! Be in line by 9:00am for the best selection.

We will have cool season vegetable starts, perennials, grasses & native shrubs for sale. Master Gardeners will be available to answer your gardening questions.

Our Western Nevada County Gardening Guide will be for sale—get one for yourself and consider buying some as holiday gifts—only \$30 each.

Nevada County Demo Garden

October

October 4

10:00 am-noon

Drought Tolerant Plants

Nevada County Demo Garden

October 4

Seasonal Gardening Workshops:

10:00am

Propagating Herbs

11:00am

Composting

Noon

Native Plants

1:00pm

Hand and Power Tools

Placer County Demo Garden

Saturdays, Oct. 4, 18

8:00 am-Noon

Visit the Placer County Master Gardeners at the Auburn Farmers' Market

Old Town Courthouse Parking Lot

Tuesdays, Oct. 7, 14, 21, 28

8:30 am-1 pm

Roseville Farmers' Market

Whole Foods Market at Fountains

October 18

10:00 am-noon

ABC's of Planting Fruit Trees

Nevada County Demo Garden

November

November 1

10:00 am-noon

It's OK, Prune Away: Tame Your Orchard

Nevada County Demo Garden

November 8

10:00 am-noon

Pruning Ornamental Plants: Art or Science? Part II

Nevada County Demo Garden

November 21-23

Visit Placer County Master Gardeners at the Mandarin Festival

Fri. 11:00 am-5:00 pm

Sat. 9:00 am-5:00 pm

Sun. 10:00 am-4:00 pm

Gold Country Fairgrounds

1273 High St., Auburn

About Master Gardeners

Our mission as University of California Master Gardener volunteers is to extend research-based gardening and composting information to the public through various educational outreach methods. We strive to present accurate, impartial information to local gardeners so they have the knowledge to make informed gardening decisions in regard to plant choices, soil fertility, pest management, irrigation practices, and more.

The Master Gardener volunteer program was started in the early 70's at the University of Washington. Farm Advisors became overwhelmed by all the incoming calls from home gardeners and homesteaders so they trained volunteers to answer these questions and the "Master Gardener Program" was born. The first University of California Master Gardener programs began in 1980 in Sacramento and Riverside counties. The Nevada County and Placer County Master Gardener Associations began soon thereafter in 1983.

Over 30 Years of Serving Placer and Nevada Counties

Production Information

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Placer County Master Gardener

Have a Gardening Question?

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Nevada County Residents

530.273.0919

Master Composter Hotline

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Log on to http://pcmg.ucanr.org/Curious_Gardener_Newsletter/ to sign up for your electronic delivery.

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