

Master Gardener  
University of California



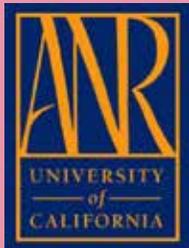
# The Curious Gardener

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The University of California,  
Agriculture and Natural Resources,  
Making a Difference for California

## Biological Fungicides: Do They Work and Are They Safe?

By Steven Swain, Environmental Horticulture Advisor, Cooperative Extension Marin County. From the April 2014 issue of the UC IPM Green Bulletin newsletter. Reprinted with the permission of the author.

The term biofungicide can have several different meanings, but it is most frequently used to refer to fungicides that contain a microorganism (usually a bacterium or fungus) as the active ingredient.

These microbially-based biofungicides are the focus of this article. Biofungicides can control many different kinds of fungi and water molds, although each separate active ingredient controls only certain pathogens. Some also control bacterial diseases. Virtually all of the organisms used in biofungicides on the market today occur naturally in soil or on plant surfaces, and most are approved for use in organic production.

Advances in fermentation technology have allowed mass production of highly specialized microbes that previously could only be grown in small batches on highly specific substrates, such as on roots infected with pathogens. Consumer demand for organically certifiable pesticides and increased regulatory pressure on older synthetic pesticides, especially in Europe, has fostered increased commercial interest in the production of living organisms that can suppress or kill pathogens.

For these reasons and also because as natural products biofungicides generally have few negative impacts on health and the environment, the number available will likely continue to increase.

Since microbial biofungicides contain living organisms, their modes of action differ from those of synthetic fungicides. Some of these mechanisms include:

- **Competition:** The biocontrol agent is more effective than the pathogen at gathering critical nutrients or space and, therefore, must be in place before disease onset.



*Powdery mildew in roses can be managed with foliar applications of the biofungicide Bacillus subtilis*

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## Biological Fungicides

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- *Antibiosis*: The biocontrol agent produces a chemical compound of some type (antibiotic or toxin) that acts against the pathogen.
- *Predation or parasitism*: The biocontrol agent directly attacks the pathogen.
- *Induction of host plant resistance*: The biocontrol agent triggers a defensive response in the host plant that limits the ability of the pathogen to invade the plant.

Most biofungicides use one or more of the above mechanisms to target only one or a few specific pests. As such, applicators should both read the label and diagnose the problem carefully to insure that the product will be effective. Biofungicides work best when applied preventively. Application after a plant is already infected has little chance of significantly altering the course of the disease for that plant, although it may decrease the ability of the pathogen to move from that plant to other plants, especially if the pathogen has to move through the soil to do so. Thus, an application of biofungicide is not likely to cure an infected plant; but it may protect other nearby plants in the field.

Although independent testing by university researchers and others has verified some manufacturer claims made for these products, efficacy data for many other products against pathogens on ornamentals is unavailable.



*Black spot on roses can also be managed with foliar applications of Bacillus subtilis*

For instance, as of early 2014, independent testing has not demonstrated adequate field efficacy of any biofungicide for landscape or agricultural use against Armillaria root rot (otherwise known as oak root rot). However, a number of biologicals have been found effective for control of *Pythium*, *Phytophthora*, *Verticillium*, and other pathogens on a variety of plant hosts. With these types of products, eradication of the pathogen is not the goal and is probably never achieved. Instead, biofungicides rely on a core tenet of the IPM philosophy: keeping pest levels below damaging thresholds and using biofungicides (when necessary) in combination with cultural practices that promote healthy plant growth.

Biofungicides cannot take the place of proper cultural care. They are a valuable tool for keeping a strong plant healthy, but they cannot forestall the inevitable. If your client's Japanese maples are routinely drowned, allowed to wilt, and then drowned again, adding a biofungicide will not prevent them from contracting *Phytophthora* if it is present in the soil.

If biofungicides are a useful and environmentally friendly tool in the landscape, why aren't they more widely used? One reason is that these fungicides rely

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*Biofungicides containing Streptomyces or Trichoderma can be used to prevent infection of plants with damping off or root or seed rot pathogens such as Pythium*

**Table 1. Sample biofungicides available for use in California landscapes.**

Active Ingredient	Sample Trade Name	Sample Diseases on Label	Types of Plants on Labels	Application Notes
<i>Bacillus subtilis</i>	Serenade, Rhapsody	Powdery mildew, bacterial spot and many foliar fungal and bacterial pathogens	Annual, perennial and woody plants	Foliar application
<i>Streptomyces lydicus</i>	Actinovate Actono-Iron	Turf diseases including Pythium, Rhizoctonia, Fusarium, powdery mildew, grey mold	Turf primarily, although used on vegetables in commercial agriculture.	Soil drench or foliar treatment
<i>Trichoderma harzianum</i>	Rootshield Home and Garden Fungicide	Many soil pathogens including Pythium, Rhizoctonia and Fusarium	Many woody or herbaceous plants	Application on seeds or roots prior to planting. Mostly used in nurseries.
<i>Pseudomonas fluorescens</i> A506	BlightBan A506	Fireblight	Apple, pear	Foliar. Used primarily in commercial agriculture. A bactericide.

**Biological Fungicides**

*Continued from previous page*

on living organisms for efficacy, so they must be stored appropriately in order to retain their fungicidal properties over time. However, a more commonly cited reason is that the personal protective equipment needed to apply them is more involved than for some other compounds. Routine exposure to the proteins found in the spray mists of some biofungicides can result in the development of allergic reactions. To keep commercial applicators safe, they must wear NIOSH approved respirators when mixing, loading, or applying biofungicides in agricultural or landscape settings. This may not be immediately obvious when reading the labels, as a quick scan often only shows the following required personal protective equipment (PPE):

- Long sleeved shirt and long pants
- Shoes plus socks
- Waterproof gloves

The respirator requirement is only evident when reading the text following the list. Biofungicides are safe to use as long as mixer/loaders and applicators have and use a respirator as part of their PPE. However, a NIOSH approved respirator requires proper training and fitting in order to be effective.

When used properly and with forethought, biofungicides can be an important part of an IPM program to prevent or mitigate problems with plant pathogens in the landscape. However, nothing can ultimately take the place of proper plant selection and care.



**Insect Trivia Quiz**

*From Bonnie Bradt, Entomologist and Nevada County Master Gardener*

1. **What is the food of honeybee queens?**
2. **What is a “King” bee called? (Hint, it is NOT “Your Majesty.”)**
3. **Who won a Nobel Prize for studying a certain aspect of insect behavior and what did he study?**
4. **What is “pseudocopulation” when referring to the world of insects?**

*Answers on Page 5*

# Vegetable Gardening with Less Irrigation

by David Deppner, Placer County Master Gardener

This year's drought has many people asking whether they should bother putting in a vegetable garden. But, for thousands of years, people have grown food with very little irrigation in much drier parts of the world. In the future, we are likely to have less water per person on average. It makes sense to rethink how we use it in our gardens.

## Plant a Fall Garden Irrigated By Rainfall

Many people plant elaborate summer gardens and then let their beds lie idle from harvest until planting again the next spring. But some people do better than that by planting over-winter cover crops to add nitrogen and organic matter to the soil and prevent erosion. Even better is to keep those beds in production year round. In this climate, there is something you can plant every month of the year. Think beyond tomatoes and corn this year, and plan ahead to put in peas and onions and fava beans this fall. Many cool season crops can yield a fall or winter harvest and be planted again for a second spring harvest. Peas are a particularly easy crop for this purpose, taste great cooked or raw, and will add nitrogen back into the soil. Plant in the fall and you rarely need to water once the plants are established. Water needs are lower and the garden will water itself with every rainstorm.

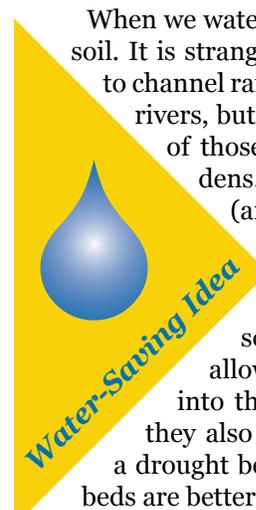
## Reconsider Your Summer Crops

Put in a little bit of research and you can find a wealth of traditional crops planted in dry areas, or drought tolerant versions of the crops you love. Corn has a reputation for needing a lot of water. But in the Southwest it's been grown with little water for many centuries, and those varieties are easy to order. Strawberries wilt in the summer sun without a lot of water, but put them where they'd like to be under a tree that partially shades them and they need less. Learn where plants came from and what they like. Pay particular attention to plants that need frequent watering. They're probably not from around here, and maybe you can find a better substitute that will still satisfy you.

## Plant As Soon As The Soil Is Warm Enough

If you plant your summer crops too early, the plants may just sit there and not grow until it gets warm enough. Meanwhile bugs are feasting on them. It's best to wait until soil temperatures are warm enough for the needs of plants like tomatoes, corn, beans, peppers, and squash. But once the soil is warm enough, don't delay. Get these plants established as soon as the soil is warm enough and they will have much more extensive root systems that can access moisture deeper under the surface once the weather gets really hot. If you don't have access to much water for irrigation you can still get a quick crop off many plants in the early summer. Trying to establish new plants later in the season takes a lot more water.

## Store Rainwater In Your Soil



When we water our plants, we are really watering the soil. It is strange that we engineer our neighborhoods to channel rain water down storm drains into nearby rivers, but then pump water from miles away out of those very same rivers to irrigate our gardens. Even in a drought year, we have spring (and sometimes summer) rains, and much of that water runs right down to the curb and we lose it. While every property is different, there are likely some minor changes you could make to allow some storm water to collect and sink into the soil. While raised beds are popular, they also have many drawbacks, particularly in a drought because they dry out quickly. In-ground beds are better at capturing and retaining runoff.

There are a lot of possible ways to capture rainwater. If you have a slope in your garden you can make a series of terraces to slow runoff and give it more time to soak in. If your garden is mostly flat, consider making depressions where water can pool and sink in. Uneven surfaces enhance infiltration. Donut-shaped depressions around perennial plants keep their crown out of the water, but allow water to pool and sink in to the root zone. If you have sandy soil, you could try slightly sunken beds rather than raised beds. Water will pool right around the plants and will soak in quickly so you won't have problems caused by standing water.

## Increase Your Soil's Water-Holding Capacity

Both clay and sandy soils are improved by adding compost. Organic matter will allow sandy soils to hold on to more moisture. In clay soils, it allows water to infiltrate more quickly to help prevent a muddy mess.

While it's generally better to practice "no till" gardening so you don't destroy soil structure, tilling can be useful when first establishing a new garden bed. Dig garden beds deeply to loosen soil and add compost and organic fertilizer. Never step on beds and compact them. The pore space in garden beds makes them capable of holding more water. Looser soil also allows roots to penetrate deeply so they can pull up moisture from further down. It's important to keep your beds covered with mulch and plants year round because even raindrops hitting the soil can compact it back down.

## Make Every Drop Count

When the hot summer sun beats down on bare soil, it causes losses from evaporation. Adding a mulch layer several inches thick will reduce evaporation by shielding the soil from the sun. Organic mulches like wood chips, grass clippings, or straw will slowly decompose and improve the soil

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## Insect Trivia Answers

1. Honeybee queens eat royal jelly. Royal jelly is secreted from the glands in the heads of worker bees, and is fed to all bee larvae, whether they are destined to become drones (males), workers (sterile females), or queens (fertile females). After three days, the drone and worker larvae are no longer fed with royal jelly, but queen larvae continue to be fed this special substance throughout their development.

2. If you checked out the answer to Question #1 then you already know this. Drones are male honey bees which are the product of an unfertilized egg. Unlike the female worker bee, drones do not have stingers and do not participate in nectar and pollen gathering. A drone's primary role is to mate with a fertile queen. LUCKY!!!

3. The behavioral scientist named Karl von Frisch won a Nobel Prize in 1973 along with several colleagues. His work centered on investigations of the honeybee and he was one of the first to translate the meaning of the waggle dance. His theory, described in his 1927 book *Aus dem Leben der Bienen* (translated into English as *The Dancing Bees*), was disputed by other scientists and greeted with skepticism at the time. Only much later was it definitively proved to be accurate. Did you all catch that? 1927??? YIKES. He was one sharp guy!

4. Despite what you may be thinking right now, pseudocopulation refers to the act of pollination which occurs when an insect tries to mate with flower parts that look to them like other insects. Poor little guys.

## Vegetable Gardening with Less Irrigation

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over time. Even if you don't grow food over winter, plant cover crops and chop them down in the spring to mulch your garden beds. Ask neighbors for their lawn clippings and leaves.

Another technique to prevent evaporation is a dust mulch. Using a hoe, loosen up the top inch or two of soil while you weed. This reduces the capillarity of the soil so moisture doesn't wick up from below. Weed seeds also have a hard time germinating on the surface when you practice dust mulching. Make sure you don't walk in these areas and re-compact the soil.

Weeds also cause water losses. Transpiration for plants is like breathing for humans. The leaves of plants breathe in carbon dioxide and exhale oxygen and water vapor. We don't want weeds using up our precious water. Mulching will help suppress weeds in your garden, but patrol for new weeds regularly. If you don't have enough organic matter to completely mulch your garden, you can use the weeds you pull as more mulch.

### Increase Plant Spacing

While some suggest spacing plants close together so their canopies shade the soil, this will cause them to compete with each other. This type of intensive gardening is great if you have lots of water and little space, but might not be ideal for our hot summers. If you are trying to reduce your water use, it's better to space plants further apart than you normally do and then mulch the spaces between them. If you plant from seed, thin a bit more aggressively than you are used to. This gives the remaining plants access to a larger area under the surface to pull moisture from without competition.

### Locally Adapted Techniques

Our Mediterranean climate is a gardener's paradise where you can harvest food every month of the year. But be aware that most gardening resources are written by people from the other side of the United States, and give instructions for gardening that are adapted for a different climate with winter snow and summer rains. Gardening in our climate calls for different techniques. Make use of the water we get, when we get it. You can have an amazing garden with no irrigation at all, or with little water other than what falls from the sky.

### Reference:

- California Master Gardener Handbook. D.R. Pittenger editor. 2002

## Did You Know ?

Female aphids can produce live, wingless daughters without ever having mated. These daughters can then produce the next generation within a week. With each of these females producing up to 12 offspring per day, it is no wonder our gardens can quickly be overrun by aphids.

Often the only thing needed to control an aphid infestation is a blast of water from a garden hose. Better yet, increase the presence of beneficial aphid enemies by planting

pollen-rich flowers and avoiding use of insecticides. To see a video of aphid insect predators and parasites in action, click [here](#).

For more information about aphids and how to control them, see UC Davis IPM Pest Note #7404 at [www.ipm.ucdavis.edu/PMG/PESTNOTES/pn7404.html](http://www.ipm.ucdavis.edu/PMG/PESTNOTES/pn7404.html)



# What is Compost Tea?

by Kevin Marini, Community Education Specialist: Home Horticulture and Composting Education

It has been almost 12 years now since I inherited the ROTLINE—a phone hotline for everything “rotting” in Placer and Nevada Counties (530-889-7399). Believe it or not, I’ve received hundreds upon hundreds of phone calls over the years from local composters asking great questions and offering personal experiences with composting. Questions like: How fast do corn cobs break down? Can I pour old champagne on my compost pile? If I spray all the bugs and spiders around my compost pile, does that hurt the compost? And, of course, one of the “old faithful” questions—I want to make compost tea, can you tell me how to do it?

## Compost Tea Defined

The first step in explaining how to make compost tea is making sure the client (you) understands what it is in the first place. “Compost Tea” means different things to different gardeners. First, let’s make sure to dispel the myth that the drainage from a compost pile or a worm bin is “tea”; in fact, that liquid solution is “leachate,” which probably does contain some nutrients, but also could contain some toxic compounds. It can be heavily diluted and applied to soil, but definitely avoid doing so around edible plants.

In the past, “compost or manure tea” referred to mixing compost or manure with water, stirring it now and then over a few days to extract the soluble nutrients and a small amount of microorganisms into the solution. The liquid would then be strained and the “tea” applied to the soil around plants. Nowadays, this is called “Non-Aerated Compost Tea” or “Compost Extract.”

The modern definition of “Compost Tea” is a bit more complex. It involves using electricity to run a pump that injects air (oxygen) into the brewing of the tea, creating what’s called “Aerated Compost Tea.” High quality compost is soaked in high quality water and oxygen is injected into the water. Then, microbial food sources are added to the brew to grow the population and diversity of the microbes present in the solution. The goal is to maximize the growth of beneficial microorganisms such as bacteria and fungi to produce a product that can be applied to the soil or foliar sprayed onto the plant itself. The idea is that a tea full of microorganisms will provide benefits to the soil and to the plants. In a sense, the tea would serve to inoculate the soil and plant with beneficial organisms as well as directly provide the plant with some nutrients.

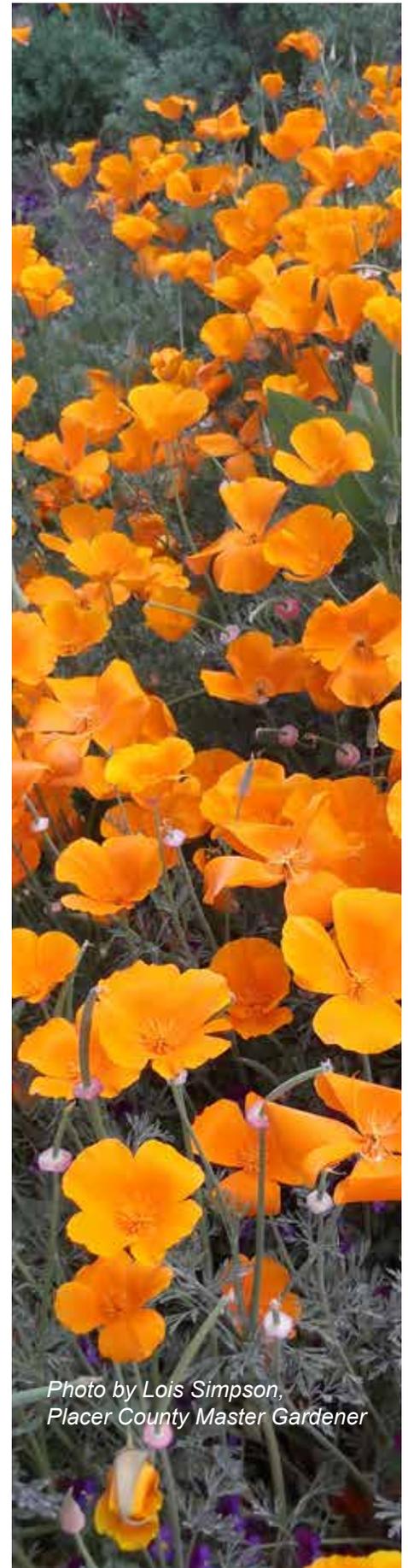
## Quality Counts!

When planning to brew compost tea, there are some important considerations. First, the water used in the brew should be free of chlorine and other types of antimicrobial chemicals that would harm the microorganisms. Next, the quality of the compost is very important to create a good tea. Since every compost is unique, depending on the source materials, only the best should be used for tea making. In fact, because pathogenic bacteria could reproduce in the tea, it is essential to start with a pathogen-free compost. Compost can be lab tested to ensure its quality. Worm castings are also a good choice as they are generally pathogen-free. Finally, the microbial foods added to the brew will dictate what type of organisms grow and reproduce in the tea.

## Using the Tea

There are basically two ways to use compost tea. It can be diluted and applied to the soil around plants, or directly sprayed on the plant itself. It is essential to use the tea as soon as it’s ready—after a brew time of 24 to 48 hours. If not used quickly after the brewing, the oxygen levels decrease and microorganisms perish.

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*Photo by Lois Simpson,  
Placer County Master Gardener*

## Compost Tea

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### What the Research Says

When compost tea is applied to soil, there are soluble nutrients that become available to plants, so there is an expectation there would be a positive plant response. However, in the published research, there isn't always a demonstrated difference between plants fed compost tea and the control. Also, the idea of spraying compost tea on the foliage of the plants is to protect the plant from disease pathogens that could attack the plant. Again, the research shows mixed results with disease suppression after compost tea applications. However, the anecdotal evidence for compost tea is very strong; I regularly hear reports of compost tea use leading to "huge yields," "pest free plants," and "vigorous growth." So, what can we conclude? Since we are learning more and more about microorganisms in the soil and in compost, and their relationship to plant growth and health, it is really too early to make any judgements one way or the other. At this point, UC Master Gardeners do not recommend the use of compost tea to prevent or cure plant disease.

### Don't Miss These Events!

Nevada County Master Gardeners'  
**Spring Plant Sale**  
May 9, 9:00 am-noon  
Nevada County Demo Garden  
1036 W. Main Street, Grass Valley

Placer County Master Gardeners'  
**30th Annual  
Mother's Day Garden Tour**  
May 10, 10:00 am-4:00 pm  
7 Gardens in Rocklin & Granite Bay  
Info at [pcmg.ucanr.org](http://pcmg.ucanr.org)

## *Iris douglasiana* 'Canyon Snow'

by Lynora Sisk, Placer County Master Gardener

Looking for a plant that requires low water and little maintenance? This issue we're featuring an Arboretum All-Star that meets these requirements and as a bonus is a California native. *Iris douglasiana* 'Canyon Snow' is one of the most dependable and beautiful irises of the Pacific coast.

This photo was taken at the UC Davis Arboretum in April 2013. As you can see, 'Canyon Snow' has white orchid-like flowers and evergreen narrow leaves that form a grass-like mound. This iris prefers the shade and is perfect to grow in a perennial border, a meadow garden or under native oaks. The beautiful white flowers bloom in the spring and attract beneficial insects. You can spread this California native by digging up and dividing the rhizomes in the fall.

'Canyon Snow' was selected by horticulturist and author Dara Emery, who served as the Santa Barbara Botanic Garden horticulturist from 1955 to 1980, and then as plant breeder to 1991. In 1978, 'Canyon Snow' received the American Iris Society's Sidney B. Mitchell award. What a star this iris is!

If you're interested in this spectacular iris or other Arboretum All-Stars, the UC Davis Arboretum will be having their public plant sales April 11, April 25 and May 16. The sales will be held from 9:00 am to 1:00 pm at the Arboretum Teaching Nursery. For more information, please check their website: [arboretum.ucdavis.edu/plant\\_sales\\_and\\_nursery.aspx](http://arboretum.ucdavis.edu/plant_sales_and_nursery.aspx)



### References:

- UC Davis Arboretum website: [http://arboretum.ucdavis.edu/allstars\\_detail\\_22.aspx](http://arboretum.ucdavis.edu/allstars_detail_22.aspx)
- The Santa Barbara Botanic Garden website: [www.sbbg.org](http://www.sbbg.org)

# Trees and Drought

by Laurie Meyerpeter, Placer County Master Gardener

I work at a nursery and fielding questions about plants is part of my job. The types of questions come in cycles and recently the majority of questions have been about the effects of drought on plants.

It began in the spring of 2014 when the most common comment was "...the top half of my tree is dead." Sadly, this is a symptom of plants that have had a water deficit, especially during the late fall and winter. In the winter of 2013-14, the soil was bone dry for many weeks due to a lengthy period without rainfall. There was healthy wood at the bottom of the tree and the bottom portion frequently had healthy leaves. The dead wood was not discolored (as might be seen with many diseases) but simply didn't leaf out above a certain point that spring. If the tree was more severely stressed, the remaining leaves were smaller than average, and some trees simply died. A determining factor in the extent of damage was how established the plant was before experiencing a chronic water deficit. Newly planted trees with limited root systems were the most likely to be damaged. Sometimes one tree was affected while a nearby tree was not, due to small differences in root growth and site variations.

In the spring of 2015, the most common question has been "how can my trees survive with the mandatory water restrictions due to the drought?" Fortunately, the winter of 2014-15 started out with good rainfall, thoroughly saturating the soil. Unfortunately, the abundant rainfall stopped, and there is virtually no snow pack to provide water for irrigation this summer. Our epic drought continues, and threatens to wreak havoc on our irrigated gardens as soil moisture evaporates and water rationing takes place this summer.

As a gardener, you should be attentive to signs of water stress. Anytime the top-most parts or outermost portions of a tree show indications of drying out, it's often a water deficit issue. If the tree doesn't leaf out in the springtime, the tips of branches die back, leaves dry out, or the margins of leaves have dry edges during the summer months, insufficient water is a likely cause. There isn't enough water from the roots to reach the outermost portions of the tree. Early signs of insufficient water include dull, faded-looking leaves and flagging or wilted foliage. If the plant doesn't receive water, the margins of leaves begin to turn brown and whole leaves dry out, particularly those leaves in the sun or at the top of the plant. Twigs begin to die. The tree becomes stressed. Often the damage isn't fully realized until the following growing season, when branches fail to leaf out or borers attack trees that have been stressed.

Trees are high-value assets in our landscapes and cannot be quickly or easily replaced. You can do several things to protect trees from damage and still comply with water restrictions, doing your part to save water.

- **Improve irrigation practices.** If you don't already have drip irrigation, install it NOW. Water trees deeply. Drip irrigation should be dripping for hours—not minutes—so that water moves deep into the soil. You should have multiple emitters for each tree—one is NOT enough. If you don't have drip, consider using soaker hoses to slowly apply water. In addition to watering deeply, water LESS OFTEN. Don't let trees get lazy; a healthy tree needs to develop deep roots and watering "deeply but less often" promotes healthier root growth patterns. Always water early in the morning.
- **When choosing new plants for the landscape, make water wise choices,** but DON'T run out and re-landscape your yard. Existing trees and woody shrubs, even ones that are not particularly water wise choices, are often more drought tolerant than we imagine. For example, I have a mature Japanese maple (sometimes considered the ultimate in wimpy plants) that gets a deep watering about twice a month. Yes, a month! The key is that it is mature and growing in the right place. In contrast, newly planted landscapes require regular water until they're established. Mature trees and woody shrubs are often the more water wise choice.
- **Consider eliminating or reducing your lawn.** It uses the greatest amount of landscape water. Let the lawn die this summer but wait until fall to plant. Replace that grass with low water-use materials such as bark, permeable paving materials, water efficient plants, or artificial turf. Call our office for lawn replacement suggestions.
- **If you decide to re-landscape, wait until fall,** just

before winter rains start, to do any planting of new trees and shrubs. Always choose water wise plants.

- **Mulch.** We can't over-emphasize the importance of a thick layer of mulch, pulled slightly away from the trunk or crown of trees to conserve soil moisture and regulate soil temperatures.
- **Weed.** Don't let weeds rob the soil of valuable moisture.

We can all do our part to conserve water during this drought. We may need to adapt our gardens to use less water now, and into the future. The good news is that most established trees should be able to maintain adequate health through the drought with proper water conservation practices.

## Resources

- Costello, Laurence Raleigh. ***Abiotic Disorders of Landscape Plants: A Diagnostic Guide.*** Oakland, CA: University of California, Agriculture and Natural Resources, 2003.
- Dreistadt, Steve H., and Jack Kelly Clark. ***Pests of Landscape Trees and Shrubs: An Integrated Pest Management Guide.*** Oakland, CA: University of California, Division of Agriculture and Natural Resources, 1994.



# 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)

### April

**April 18**

10:00 am-3:00 pm

**City of Roseville Celebrate the Earth Festival**

Mahany Regional Park, Roseville

**April 22-23**

10:00 am-3:00 pm

**Sierra College Earth Day**

Sierra College, Rocklin Campus

### May

**May 1, 2, 3**

**Visit Placer County Master Gardeners at the Auburn Spring Home Show**

Gold Country Fairgrounds

**May 2**

10:00 am-noon

**Build a Raised Garden Bed**

Nevada County Demo Garden

(In case of bad weather: NID annex)

**May 9**

9:00 am-noon

**Spring Plant Sale**

Nevada County Demo Garden

**May 10**

10:00 am-4:00 pm

**30th Annual Mother's Day Garden Tour, Placer County Locations TBA**



Nevada County events  
in green boxes



Placer County events  
in yellow boxes

**May 16**

**Seasonal Gardening Workshops:**

9:00 a.m. **Methods for Amending and Improving Your Soil**

10:00 a.m. **Composting**

11:00 a.m. **Planting for Pollinators and Beneficial Insects**

12:00 p.m. **Square Foot Beds,**

**Lasagna Gardens, Biointensive**

**Methods: What Does It All Mean?**

Placer County Demo Garden

**May 30**

9:00-11:00 am

**Basic Composting**

San Juan Water District,

9935 Auburn Folsom Rd., Granite Bay

**May 30**

10:00 am-noon

**Growing in a Greenhouse**

Elks Lodge, lower level meeting room

109 S. School St., Grass Valley

### June

**June 6**

10:00 am-noon

**Container Gardening: Vertical, Artistic and Practical**

Nevada County Demo Garden

(In case of bad weather: NID annex\*)

**June 13**

10:00 am-noon

**The Frugal Gardener: Creative Reuse in the Garden**

Nevada County Demo Garden

(In case of bad weather: NID annex)

**June 20**

10:00 am-noon

**Gardening Smart: Practical Tips to Make Vegetable Gardening Less Work**

Nevada County Demo Garden

(In case of bad weather: NID annex)

### July

**July 18**

**Seasonal Gardening Workshops:**

9:00 a.m. **Summer Care and Maintenance of Your Soil**

10:00 a.m. **Harvesting and Preserving Your Summer Bounty**

11:00 a.m. **Starting Your Winter Garden**

12:00 p.m. **A Home Gardener's Guide to Seed Saving**

Placer County Demo Garden

### Growers' and Farmers' Markets

**Saturdays, Mid-May to Mid-Sept.**

8 am-Noon

**Visit Nevada County Master Gardeners at the North Star House Growers' Market, 12075 Auburn Rd., Grass Valley**

**1st and 3rd Saturdays, May to Sept.**

8 am-Noon

**Visit Placer County Master Gardeners at the Auburn Farmers' Market Old Town Courthouse Parking Lot**

**Tuesdays, May to Sept.**

8:30 am-1:00 pm

**Visit Placer County Master Gardeners at the Roseville Farmers' Market Whole Foods Market at Fountains**

## 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

*The Curious Gardener* is published quarterly by the University of California Cooperative Extension Master Gardeners of Placer and Nevada Counties.

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Placer County Master Gardener

Have a Gardening Question?

Call our Hotline

Placer County Residents

**530.889.7388**

Nevada County Residents

**530.273.0919**

Master Composter Hotline

**530.889.7399**

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### How to Subscribe

Online subscriptions are free to residents of Placer and Nevada Counties.

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