



VOLUME 20, NO. 2  
SPRING 2013

## PREPARING YOUR SOIL FOR SPRING PLANTING

*Elaine Applebaum*  
Placer County  
Master Gardener

It's Spring and the birds are busy building nests in preparation for the arrival of their babies. Likewise, gardeners should be preparing their soil in anticipation of the seeds and transplants they will be raising this growing season.

Whether you're growing vegetables or flowers, a well-prepared bed is the key to a successful garden. The goal is to provide the necessary nutrients and best growing environment for your plant "babies."



This article will focus on prepping the soil for a vegetable garden, but many of the tips apply to flower and shrub beds as well.

Vegetables grow best in deep, friable soil with good drainage. Avoid shallow and compacted areas. Choose a flat location that gets at least six to eight hours of sunlight. Root and leafy crops, such as beets, carrots, lettuce and other greens, can tolerate a little shade.

### Initial Preparation

The first thing you want to do is remove any rocks and weeds. Removing weeds before they go to seed will save you work in the future. If you had any disease problems in that area last year, remove any roots or debris left over from that crop. Otherwise, you can leave the organic residue to decompose and feed the worms and microorganisms that will convert it into nutrient-rich humus.

All gardeners dream of having the perfect soil: a deep, crumbly, nutrient-rich loam. Few if any of us in this area are blessed with that. But no matter what we start off with—a heavy soggy clay, infertile overdrained sand, or any thing in between—all can be improved by the addition of organic matter.

*(continued on page 2)*

### Attention Subscribers!

Effective January 2014, The Curious Gardener newsletter is transitioning to an online newsletter, available only in electronic format.

If you are currently receiving a hard copy of the newsletter in the mail, please log on to <http://ucanr.edu/curiousgardener> to change your subscription to electronic delivery. Thank you!

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THE CURIOUS GARDENER

...A QUARTERLY NEWSLETTER PUBLISHED BY THE UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION AND THE UC MASTER GARDENERS OF PLACER AND NEVADA COUNTIES

Organic amendments include animal manures, peat moss, compost (home-made or store bought), or the residues of a cover crop (green manure) planted by those gardeners savvy enough to have planted one in the fall.

A general rule of thumb is to add 1 pound of organic matter for every 4 to 5 square feet of garden area. This should be done several weeks before planting to allow time for it to decompose.

### To Till or Not to Till? That is the Question

There is some discussion in farming circles as to the practice of tilling. Some recommend mixing amendments into the top 6 to 12 inches of soil either mechanically with a rototiller or by hand with a digging fork or spade. This may be the best method when starting a new bed from scratch.

Proponents of the no-till method advise simply placing the organic material on the soil surface and allowing worms and nature's processes to mix it in naturally. This may be best for enhancing existing beds so that you don't destroy the soil structure and disturb all the beneficial critters that inhabit a healthy soil.

Either way, it is important to not work in the soil if it is too wet because you will compact it into clods. If you squeeze a handful of soil and it stays together in a ball, it is too wet—wait until you squeeze it and it falls apart into loose crumbles.

Before planting, rake the surface of your planting bed smooth, removing any large rocks and breaking up large clods. You may want to create raised beds or rows to enhance drainage. Raised beds also allow the soil to warm up faster in

the spring, which will aid germination of seeds. Avoid walking on the prepared soil to keep from compacting it.

### Nutrient Needs and Tests

Most vegetable crops require a steady supply of nutrients for best growth. Soils amended with manures and compost will most likely provide enough of the elements needed except nitrogen. Examples of commercially available nitrogen for home gardens include alfalfa meal, cottonseed meal, ammonium nitrate, ammonium sulfate and urea.

Low concentrations and time-release formulas are best to avoid the rapid flush of tender growth that attracts pests. Nitrogen should be added to the soil prior to planting and then again at regular intervals during the growing season.

Before adding any fertilizer, it is important to test your soil so you know what, if anything, to add. A simple soil test kit can be purchased at most garden centers. This will tell you the pH of your soil (whether it is acidic or alkaline) and the amount of the three major nutrients, nitrogen, phosphorus and potassium, needed.

Most vegetables do best with a pH between 5.5 and 7.5. If your soil is too alkaline, add soil sulfur; if it is too acidic, add lime. **Always follow directions on the product label and realize that large changes will take some time.**

If you've had persistent bad results in your garden, or you'd like a more accurate, in-depth look at your soil, you might want to send samples to a professional testing lab.

For a fee, these labs will analyze not only the pH and levels of NPK, but will also test the levels of Calcium, Magnesium, Sulfur and about a dozen different micronutrients in

your soil. Even though you only need small amounts of the micronutrients, an inadequate level of just one of them can limit the production of your garden. A list of testing labs in California can be downloaded from [ucanr.org/sites/gardenweb/files/82228.pdf](http://ucanr.org/sites/gardenweb/files/82228.pdf).

Depending on the results of your soil test, add the appropriate organic or chemical fertilizer and/or minerals, being sure to read and follow the package directions carefully. **With fertilizer, more is NOT better.** Over-fertilizing harms the environment, burns your plants and wastes money.

In general, synthetic fertilizers act quickly but don't last as long and have a greater potential for damaging the environment. Natural organic fertilizers may take longer to see results, but have long-lasting effects and are less likely to harm beneficial soil microbes.

Fertilizer can be applied either in a shallow groove 4 to 6 inches on each side of the rows where vegetables will be planted, or scattered over the surface of the bed and lightly raked in.

A well-prepared soil bed is the first and most important step toward a successful vegetable garden. Your seedlings and transplants will appreciate the work you've put in and reward you with a bountiful, tasty crop. Enjoy!



### References

California Master Gardener Handbook, UC ANR publication# 3382

Questions and Answers About Soils and Fertilizer in the Garden, <http://ucanr.org/sites/gardenweb/Vegetables/?uid=26&ds=462>

UC IPM Online: [www.ipm.ucdavis.edu/PMG/GARDEN/veggies.html](http://www.ipm.ucdavis.edu/PMG/GARDEN/veggies.html)

Lynn Lorenson  
Nevada County  
Master Gardener

# MOSQUITOES AT MY EAR

*Mosquito at my ear.  
Does it think  
I'm deaf?* Issa 1796-1828

## California, once a hotbed of mosquito born disease

We bask in warm weather swatting mosquitoes. Will we wake with a fever from malaria? Until the 1900's Placer and Nevada Counties were a malaria hot zone. Thanks to habitat destruction, treatment of waters with insecticides and treatment of infected humans, malaria is no longer present.

The last recorded case of malaria contracted in California was in Sacramento in 1984. In 1952 three campers at Lake Vera, in Nevada County, were infected. A returning Korean veteran carried the malaria parasite.

Could this deadly disease become reestablished you ask? Yes, though unlikely. Malaria has now resurfaced in Greece. The failing economy leaves no funds for mosquito abatement agencies to treat water bodies for mosquitoes. There is a large group of people from North Africa who are infected with malaria that are not being treated.



Individuals and government agencies must remain diligent in preventing the reemergence of mosquito-born diseases.

## Mosquito Carried Diseases in California

Many species of mosquitoes carries West Nile virus (WNV). This disease was first recorded in the

West Nile area of Northern Africa in 1937. It has now spread world-wide. In 2012, only Texas had more cases than California. The virus can cause severe neurological damage with results similar to polio. One third of horses that become infected die. The reservoir of disease is in wild birds and horses.

The *Anopheles* and *Aedes* ( tree hole) mosquitoes carry dog heart and lungworm. The reservoir of disease is in coyotes and foxes.

## UC leads the way in mosquito research

William "Billy Bugs" Reeves lead the way in discovering which mosquitoes carry disease to humans and animals. He started the world-recognized UC Mosquito Research Department. He developed the use of *sentinel chickens* to monitor the presence of West Nile Virus & Western Equine encephalitis.

Mosquitoes carrying the virus bite chickens. They do not become ill, but develop antibodies to the virus. Blood samples collected from the chickens tell the local Agriculture Departments, state agencies and the Center for Disease Control (CDC) that the disease is present.

## Telling Mosquitoes to buzz off

The first line of defense against mosquito born diseases is to prevent the growth of mosquito larvae. Mosquitoes breed in **still water**: containers, birdbaths, road ruts, low spots in flood irrigated fields, marshes, watering troughs, impound stock-ponds, old tires, hardwood tree holes.

Most mosquitoes breed in warm weather. In elevations below 1,000 ft. the *Culex* mosquito that carries encephalitis can breed in cool weather.

Empty all standing water in containers at least 1 time per week or treat the area to prevent the growth of mosquito larvae.

**Biological control** conserves the non- target predators that eat mosquito larvae such as water bugs, dragon fly nymphs and back- swimmers.

*Bacillus thuringiensis israelensis* (BT) produces a toxin that kills mosquito larvae, but is non-infectious. *Bacillus sphaerecies* is a living form that is infectious to mosquitoes. Early treatment has the best affect, as the *Bacillus* bacteria do not kill mosquito pupa or larvae near pupation.

Mosquito fish (*Gambusia affinis*) are effective against the mosquito that carries West Nile Virus. The non-native fish is illegal to introduce into ponds that connect to natural waters or into natural waters in California.

In ponds with shallow, weedy edges the mosquito fish may do more harm than good. They will eat the natural predators that lurk there.

Stock & decorative ponds should have straight sides & be free of weeds along the edges.

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Mosquito fish do not control the mosquito that carries malaria as well as dog heartworm. The *Anopheles* mosquito larvae live on rafts of vegetation and algae. The non-native hardy carp is effective in ponds not connected to natural waterways.

Bats, swallows, dragonflies and damselflies consume but do **not reduce** the mosquito population enough to break the disease cycle or reduce the annoyance.

**Pesticide control** is very effective against mosquito larvae. Pesticide application for mosquito control needs a special permit and may only be applied by a licensed applicator in California. Mosquitoes may develop resistance if the same pesticide is used over many generations.

There is no effective biological or chemical control for adult mosquitoes.

### Personal protection

Stay inside at dawn and dusk. The repellent *DEET*, 10-50% is effective against mosquito bites for 4 hours. The insecticide *permethrin* applied to clothing gives a 4-hour protection. Soybean oil applied to the skin every ½-1 hour also offers some protection.

Vaccines against WNV and equine encephalitis are available for horses.

Monthly heartworm medication protects dogs against the heart and lungworm parasite.

**Ineffective repellants and controls abound:** wristbands, vitamin B1, brewers yeast, garlic, citronella, aromatic plants, incense, ultrasonic emitters and electric grids.

Electronic bug zappers kill more insects that prey on mosquitoes than mosquitoes. CO<sub>2</sub>/light traps attract and kill adult mosquitoes,

but must not be placed near homes or animal pens as they attract mosquitoes.

Preventing the breeding of mosquitoes is the best defense against the threat of disease and the annoyance of mosquitoes buzzing in your ear.

### References

LA County West Vector & Vector-Born Disease Control District

Mosquito & Vector Control of Santa Barbara County, CA

Nevada County: <http://www.mynevadacounty.com/nc/cda/eh/Pages/Vector-Program.aspx>

Placer County: <http://www.placermosquito.org/>

UC Mosquito Research:

*Managing Mosquitoes in Surface-Flow Constructed Treatment of Wetlands.* ANR Pub. 8117

*Managing Mosquitoes on the Farm.* ANR Pub. 8158

The Nevada County Master Gardeners  
invite you:

## Spring Plant Sale

May 11, 2013  
9am-Noon



Locally-grown vegetable starts,  
flowering perennials, and much more!





## BULLETIN BOARD



### The Placer County Master Gardeners Present 28th Annual Mother's Day Garden Tour

Sunday, May 12, 2013  
10am to 4pm

This garden tour will be focused in the lower elevations of Placer County with gardens located in Rocklin, Roseville, Granite Bay and Loomis.

Tickets available at local nurseries mid-April

<http://pcmg.ucanr.org>



### Sierra College Community Education

<http://www.sccommed.org/>

- Local Foods and Nutrition, April 13, 2013, from 9am-3pm, Rocklin Campus with Joanne Neft
- Waterfalls, Water Features and Ponds, April 13, from 9am-4pm, Nevada County Campus

# HEIRLOOM VEGETABLES: THE GARDEN YOUR GRANDPARENTS GREW

*Mike Kluk*  
Nevada County  
Master Gardener

This is the time of year when a gardener's fancy turns to seed catalogs and dreams of the perfect plump tomato and the sweetest corn. As you work your way through catalog pages of tantalizing looking vegetables you will notice that some seeds are labeled "hybrid", some are "heirloom" and some may be referred to as "open pollinated." So, what's the difference?

**Hybrid vegetables** are the product of a plant breeder's work. They have two different parent varieties that are chosen because they will impart particular characteristics to the offspring such as disease resistance, early ripening, etc. (A vegetable variety is a version of a particular vegetable with specific and recognizable characteristics. For example, Chantenay and Danver's Half Long are two varieties of carrot.)

Because they are a combination of two different varieties, the seeds of a hybrid plant will generally not produce a plant identical to the hybrid parent. **For the record, hybrid vegetables are not genetically modified organisms or GMO's.** Hybridization is simply crossing two different varieties and is a process that has been practiced for over ten thousand years.

Reportedly, no GMO seed is currently sold to the public. If you are concerned that seeds you purchase may be genetically modified, you can purchase certified organic seed which is guaranteed to not be genetically modified.

**Open pollinated vegetables**, will, when pollinated by the same variety, produce offspring true to the parents. Of course, if pollinated by a different variety, the seeds are hybrid and all bets are off.

The definition of **heirloom vegetables** is less clear and less consistent. They are generally "old" vegetable varieties that have been grown from year to year and generation to generation. Some claim the seeds must have been saved by a family or clan through the years. Others say they must have originated before modern hybrid seed production became commonplace (around the end of the World War II). Still others say they must be at least one hundred years old.

Regardless of the precise definition, heirloom vegetables are all open pollinated because the seeds have been pollinated and saved from year to year, producing offspring with the same characteristics as the parents. They come to us largely unchanged over generations, if not centuries.

*Why would we even bother to grow those "old" vegetables instead of the improved product resulting from modern scientific plant breeding?*

There are many reasons:

While taste is somewhat subjective, heirloom vegetables are regularly described as being more flavorful than their modern hybrid counterparts.

There is a certain romance and

connection to our heritage in growing the vegetable varieties that our grandparents and even their grandparents grew.

The committed gardener can save the seeds from an heirloom vegetable, plant them again next year, pass the seeds on to friends and preserve that little bit of the gene pool for future generations. By carefully selecting only the best plants from which to save seeds, subsequent generations should perform better in a particular climate and soil.



In this article, we will look at some of the advantages

and challenges of growing heirloom vegetables and list some of the most popular varieties. We will also consider when a hybrid variety may actually be a more practical choice for your garden. Finally, because saving heirloom seeds is a primary motivation for some gardeners, we'll take a quick look at that process too.

## **The Romance of Growing Heirloom Vegetables**

For some, just the deeply descriptive and sometimes wistful names of heirloom vegetables is reason enough to grow them. Compare the names of heirloom tomatoes Mortgage Lifter and Box Car Willie with the more sedate and even boring names of their hybrid counterparts, Ace and Celebrity.

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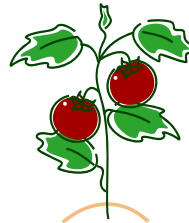
The names of other heirloom vegetables that may pique your interest are: Jacob's Cattle dry bean, Bloody Butcher red flint flour corn, Queen Anne's Pocket melon, Grandpa Admires lettuce, Corno di Toro (Horn of the Bull) pepper, Dr. Wyche's Yellow tomatillo, Moon and Stars watermelon, and Beck's Big Buck okra.

Not all heirloom varieties are unique or exotic. The common-place iceberg lettuce and roma tomatoes are both heirlooms. But many heirlooms will add an extra element of interest to your garden. Some less common vegetables are available only as heirlooms because they do not have a large commercial value and so do not justify the expense of breeding a hybrid. A few of these are orach, or mountain spinach, a green that is eaten raw and cooked; salsify, a root vegetable; ground cherries, which are related to tomatillos; kohlrabi, a brassica somewhat similar to turnips; and Jerusalem artichokes or sunchokes, a tuber related to sunflowers.

**Flavor** is the most commonly mentioned reason that people turn to heirloom varieties. Flavor is influenced by a number of factors. Growing conditions, plant care, harvesting time and expectation all play a role. Many of the commercially available hybrids have been bred for characteristics other than flavor such as appearance, productivity and tolerance to shipping. Heirloom varieties may also have been selected over the years for characteristics other than flavor, but it is unlikely that Great-Grandpa saved seed from a tomato variety with mediocre flavor regardless of how uniform the fruit was. Heirloom vegetables do not always

taste great however and may have been passed down over time for other characteristics. Roma and Principe Borghese are heirloom tomato varieties. Few would rave about their flavor, even when vine ripened. But the former is a good, dependable paste tomato and the latter is wonderful dried. Preacher Hill corn is not memorable as corn on the cob, but when dried and ground into meal, it makes excellent cornbread.

Tomatoes are the princes of the heirloom world. Heirloom tomatoes get a lot of attention and, no surprise, marketing effort. You are not going to find many comparative taste tests reported of heirloom cucumbers, but there are many for tomatoes. Several studies cited in a July, 2012 *Scientific American* article found that heirloom tomatoes tend to have higher concentrations of "volatile compounds" that together make up what we recognize as tomato flavor. So, there is a scientific basis for what seems to be the consensus opinion that heirloom tomatoes generally taste better than hybrids.



All hybrids don't taste like cardboard however. Some of the bad rap they get is probably due to the fact that commercial tomatoes - mostly all hybrids -- are often picked green to ship better. One of the few studies that compared the flavor of heirloom tomatoes with hybrid tomatoes was conducted by the University of Missouri. The study evaluated 72 different varieties. Two hybrids, SunSugar and Sweet Treats were rated highest. Heirlooms demonstrated their flavor prowess by holding eight of the top twelve spots in this

study. The top two heirlooms were Mortgage Lifter and Mr. Underwood's German Pink.

The same study evaluated the flavor of 59 pepper varieties. There, heirlooms fared better, taking the top nine spots with the top hybrids finishing tenth and eleventh. The top two peppers were Fatali and Jamaican Chocolate. A few other heirloom peppers that scored high were Jimmy Nardello's, Lipstick and Sweet Gourmet.

### Heirloom Vegetable Advantages and Disadvantages

There are advantages to heirlooms in addition to their better flavor. As mentioned above, the seeds have generally been saved for generations and you can continue that chain.

You can avoid the expense of buying all new seed every year, and feel good about preserving a piece of gardening heritage. The scope of this article allows for only a quick look at seed saving, but it will hopefully encourage you to learn more

The first consideration is whether the vegetable from which you are planning to save seeds is largely self-pollinating, or pollinated primarily by wind or insects.

Self-pollinating plants are easier to work with because you do not need to be as concerned that they will cross with another variety, forming a hybrid. Self-pollinators include peppers, eggplant, lettuce, beans, peas and tomatoes. You are fairly safe if different varieties are planted 10 to 20 feet from each other.

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Most of the other vegetables such as onions, squash, beets, broccoli, corn and spinach are pollinated by wind or insects. They may need to be isolated from other varieties by a distance of several hundred yards or more to avoid cross-pollination.

Alternatively, you can grow just one variety at a time or isolate some in insect proof cages to produce seeds that are true to variety. If cross-pollination occurs, it will affect only the characteristics of next year's plants grown from the hybrid seed. The characteristics of the vegetables you harvest this year will *not* be affected, even if the blossoms from which they developed were pollinated by a different variety.

Once you have limited the possibility of cross-pollination, save seed from several individual plants that seem the healthiest and have the characteristics you want. Over many generations this will allow you to improve the quality of the heirloom plants you produce by selecting for desirable characteristics that make the variety better adapted to your garden. You should wait for the seeds to fully mature before harvesting them.

Once harvested, they will need to be thoroughly dried, a process that is usually completed inside. Store seeds in a sealed container in a cool, dry location away from direct light. Enjoy planting your own seeds the following year and don't forget to share with your fellow gardeners.

Given that seed saving has the potential pitfall of unwanted cross-pollination, it would seem that the idea old-time heirloom vegetables

have never been hybridized is probably unrealistic. It is unreasonable to expect that Great-Great-Aunt Tillie's famous sweet corn was never pollinated by another corn variety as it was grown and passed down to Great-Uncle Fred, second cousin Vinnie, your father, and finally to you. In fact, it could be that hybridization has improved some varieties that have now become stable. That is the most we can say. Heirloom varieties may have been hybridized at some point in their past but have now stabilized, and if pollinated by the same variety will produce offspring that are true to type.



Heirloom vegetables tend to be more finicky than their hybrid cousins. They may not be able to thrive in a wide range of climates or soil types. They may not be as resistant to various diseases. They may be less productive or slow to ripen, especially in the foothills where cool nights are common. If you have limited space, it may be difficult to find heirloom cucumbers and squash with a compact growth habit.

Because of this, it is particularly important to investigate and grow a number of heirloom varieties to determine which ones will do best in your garden. Ask fellow gardeners, who have similar growing conditions and soil types, for recommendations.

If a particular variety does not work out, there are plenty more to choose from next year. Enjoy the process; the results will be well worth it.

Do not be reluctant to grow some hybrid varieties, especially during your first few years of investigating heirlooms. Many gardeners have given up on heirloom varieties completely after poor showings in the first year or two of trying them. As with any other endeavor, gardening success encourages us to stick with it. Hybrids can be an important part of the mix, especially while you are finding heirloom varieties that will grow well for you.

The concept of "hybrid vigor" is not a myth. Hybrids will generally be more disease resistant and more dependable producers over a wider range of conditions. When vine ripened, they will taste much better than the version available from the supermarket -- even if they fall short of many heirlooms.

Heirloom seeds are commonly available from our local nurseries and many seed companies allow you to order over the internet, by mail or phone. Enjoy growing the wide variety of heirloom vegetables available to you.

### References

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*Western Nevada County Gardening Guide*, 2010, University of California Cooperative Extension

*Share this Heirloom Seed*, 2010, University of Illinois Extension, <http://web.extension.illinois.edu/state/newsdetail.cfm?NewsID=17661>

*Tomato and Pepper Taste Test Results*, 2011, University of Missouri Extension, <http://aes.missouri.edu/bradford/events/tomatofest-summary.php>

*Why Heirloom Tomatoes Taste So Good*, June, 2012 Scientific American, <http://www.scientificamerican.com/article.cfm?id=why-heirloom-tomatoes-taste-so-good>





# SPRING 2013 WORKSHOP CALENDAR



## APRIL

Saturday, April 6th from 9am-11am at Placer MG Demonstration Garden (11477 E Ave. Auburn):  
***Managing Pests in the Garden (Integrated Pest Management)***

Saturday, April 13th from 8:30am to 10am at Roseville Utility Exploration Center (Mahany Park)  
***Spring Forward with Cool Season Vegetables***

Saturday, April 13th from 10am-Noon at Grass Valley Veteran's Building (255 S Auburn, GV):  
***Grow Great Vegetables This Summer!***

Saturday, April 13th from 10am-Noon at Placer MG Demonstration Garden (11477 E Ave. Auburn):  
***Drip Irrigation: Watering Right Where It's Needed***

Saturday, April 20th from 9am-11am at Placer MG Demonstration Garden (11477 E Ave. Auburn):  
***Starting a Vegetable Garden***

Saturday, April 20th from 10am-Noon at NC Master Gardener Garden (1036 W. Main, GV):  
***Composting: From Leaves to Black Gold***

Saturday and Sunday, April 27 & 28, from 10am to 4pm at Nevada County Fairgrounds:  
***Visit the Nevada County Master Gardener Information Booth!***

## MAY

Saturday, May 4th from 9am to 11am at Placer MG Demonstration Garden (11477 E Ave. Auburn):  
***Composting (9am to 10am) and Vermiculture (10am to 11am)***

Saturday, May 4th from 10am-Noon at NC Master Gardener Garden (1036 W. Main, GV):  
***Disease or Bugs: The Organic Solution***

Saturday, May 11th from 9am-Noon at NC Master Gardener Garden (1036 W. Main, GV):  
***SPRING PLANT SALE!!!***

Saturday, May 11th from 8:30am to 10am at Roseville Utility Exploration Center (Mahany Park)  
***Mulching Basics***

Saturday, May 18th from 10am-Noon at NC Master Gardener Garden (1036 W. Main, GV):  
***Container Gardening: Hands-On Training for All Skill Levels***

Saturday, May 18th from 9am to 11am at Placer MG Demonstration Garden (11477 E Ave. Auburn):  
***Growing an Herb Garden***



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*The Curious Gardener* is published quarterly in January, March, June, and September.

## 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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