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Grave Danger Ahead for California's Citrus Trees

Kathy Polkinghorn, UCCE Master Gardener, Yolo County



Asian Citrus Psyllid - UC IPM

When I was growing up amid cornfields in Iowa, the magical land of California, where oranges grew on trees, seemed like a dream. But now, the commercial citrus orchards and backyard orange, grapefruit, mandarin, and lemon trees, which evoked my dreams of a Golden State, are threatened by a tiny sucking insect, the Asian citrus psyllid, and a bacterial disease it spreads called huanglongbing or HLB disease. Can you imagine California without Valencia Orange juice or Meyer lemons? Unfortunately, because of the rapid encroachment of this tiny noxious sucking insect from Florida and Mexico throughout the southern U.S., California is one of the last bastions of the citrus industry, but for how long? The clock is ticking in California.

In the nineteenth century, the noble grape was similarly threatened and the wine industry worldwide nearly destroyed by another sucking insect, a root louse called phylloxera. Grape cultivators from the Americas unwittingly carried the insect with them on wild grape cuttings to Europe. As vineyards died across Europe, the townspeople of one French hamlet even collected the urine of schoolboys and tried spraying it around their vines. A remedy wasn't discovered until researchers identified phylloxera and began the process of grafting the vulnerable vines onto resistant rootstock. Grape producers had to start over.

Something like this is now happening to the North American citrus industry. Huanglongbing (HLB) disease, which originated in Asia or India, was found in Florida in 2005 (six years after the Asian citrus psyllid entered

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the state), and now affects citrus trees in all commercial orchards in Florida. University of Florida researchers estimate HLB has cost the Florida citrus industry \$9 billion.

The psyllid carries bacteria for HLB from infected trees to other citrus trees or to related ornamentals, such as orange jessamine and box orange. Spread from one backyard to another, HLB hitchhiked on nursery plants from Florida into Louisiana, Alabama, Georgia, Mississippi, South Carolina, Arizona, Hawaii, and is in Southern California. The psyllid was identified in San Diego and Los Angeles in 2008. In March 2012, HLB was found in a citrus tree in Los Angeles. Currently the psyllid is widely distributed in Southern California and becoming more widespread in the Central Valley and further north. More than a dozen trees infected with huanglongbing have been found and removed in Los Angeles.

The university is asking Master Gardeners to instruct and advise home gardeners on how to identify the adult psyllid and nymphs by how they look (a clear band on a brown wing), how they feed (body tilt), and by a waxy tubule produced by the nymph.

The Asian citrus psyllid is a tiny brown insect about the size of an aphid with brown ruffled wings and a clear strip along the wing visible with a hard lens. The psyllid has a pointed front end, red eyes and short antenna. The adult psyllid feeds head down and body elevated at a 45-degree angle, tail in the air. No other citrus pest feeds this way. Psyllids remove sap from the plant tissue and inject a salivary toxin as they feed. This deforms the new tender leaves by twisting and curling them and kills new shoots by burning them back. On their own, psyllids stunt tree growth, especially of young trees. If the psyllid is a carrier of HLB, it will kill the tree.

Adult psyllids live one to two months. Females lay tiny yellow-orange almond shaped eggs in the folds of the newly developing flush leaves of citrus. Each female lays several hundred eggs, which hatch into yellow, orange or brown nymphs that are wingless. They molt four times increasing in size each time and can feed only on the new soft green leaf tissue. As the nymphs remove sap, they excrete a large quantity of sugary honeydew. This promotes the growth of sooty

mold. Each nymph also produces a waxy tubule from its rear end to clear the sugary waste away from its body. The tubule's shape, a curly tube with a bulb at the end, is another unique identifier.

Early symptoms of HLB on a citrus tree are an asymmetrical blotchy yellowing of leaves, or the yellowing of leaves on an individual limb or one sector of a tree's canopy. As the disease progresses the fruit becomes smaller, stays partially green, and the juice turns bitter. For this reason



HLB is also called citrus greening disease. HLB poses a vexing control problem because the disease takes two seasons to show up on the tree after the tree has become infected. **There is no known cure.**

The California Department of Food and Agriculture is monitoring the progress of the psyllid and HLB in California with traps, establishing quarantine zones, the release of biological control agents and by prioritizing areas for residential chemical control.

Homeowners and landscapers can combat the psyllid by inspecting the new flush growth on their citrus trees, reporting infestations, controlling ants around their trees, respecting quarantine zones, not grafting from a neighbor's tree, and by purchasing citrus only from certified nurseries. If you think you may have found the psyllid, call the California Department of Food and Agriculture (CDFA) Exotic Pest Hotline (800-491-1899). They will come out to your yard and take it from there.

For photos of the Asian citrus psyllid (ACP) and HLB symptoms, visit the California Citrus Threat web site (<http://californiacitrusthreat.org/>). For a distribution map visit the ACP Distribution and Management web site (<http://ucanr.edu/sites/ACP/>).

Source: UC IPM Pest Notes: "Asian Citrus Psyllid and Huanglongbing Disease" (revised 6/16) (<http://ipm.ucanr.edu/PMG/PESTNOTES/pn74155.html>)



Planting the Past: How to Save

Jack Kenealy, UCCE Master Gardener, Yolo County

Memories can be funny and fanciful things. Sometimes they lead us down unexpected paths. So it is with me, remembrance of my mother's favorite pickled peppers and learning how to save seeds. Growing up in Merced, California I loved a particular brand of pickled peppers that my mother usually had in the refrigerator. Mom has been gone a long time now, but occasionally I pick up a jar, devour the peppers and use the vinegar to pickle an egg or two. A month ago I decided to grow the pepper and pickle it myself as I love to garden and can. Simple. Or not.

It turns out that the type of pepper I was looking for, the Sierra Nevada Chileno, is almost impossible to find. In many internet searches I learned there were nurseries in the Bishop area that occasionally had plants for sale but other than that I could find no source for this Italian wax style of pepper. As happens with the internet, I found a post on a garden association message board from over two years ago. An individual from the Sierra foothills indicated he had seeds of the pepper he was willing to share with the folks posting on the blog. I was able to contact him and he was nice enough to send me some seeds. Several sprouted and I have the young plants growing outside. I was greatly impressed with his ability to produce seeds of a particular strain of peppers.

The experience was an eye-opener for me. My only previous experience with saving seeds was years ago. I planted some marigold seeds from a spindly old plant and I grew spindly new plants. That I might have predetermined the outcome by my selection of the seeds did not occur to me. But this was a seed saving experience of an entirely different dimension and I resolved to learn how to save seeds from two of my favorite vegetables: tomatoes and hot peppers.

There are any number of reasons to save seeds. The Seed Savers Exchange, a non-profit organization devoted to maintaining bio-diversity and preserving our seed heritage lists more than forty reasons to save seeds on their web page (<http://seedsavers.org>). Cost is one factor. A package of seeds can cost almost three dollars and a tomato plant costs anywhere from five to ten dollars each depending upon source, variety and size. Preserving heritage is another big reason to save seeds. I enjoy reading the Seed Savers Exchange catalog each year as it provides the history behind many varieties. But the ability to duplicate an exceptional success or to develop a plant that is adapted to the micro-climate surrounding my garden is the biggest attraction for me.

Often when learning a new skill, it is best to start with the easy before tackling the hard and so it is with seed saving. Fortunately, tomatoes and peppers are among the easiest of seeds to save. Beginners should have no trouble saving beans, lettuce and peas as well. Carrots and beets are much harder since it takes two years for seeds to set.

Seed saving is essentially a three step process: selection, collection and storage. Only open pollinating or self-pollinating plants should be selected. Open pollinating varieties are stable and result from pollination between the same genetically similar parents. These are **not hybrids**. Tomatoes are self-pollinating, which means that pollination takes place within a single flower, usually before it opens. Peppers are open pollinating plants but hybrids are common so beware.

Healthy, viable seeds come from healthy plants. Select a tomato or pepper that typifies the qualities you wish to replicate. In my case, I selected a tomato from an heirloom plant, Gill's All Purpose, I bought last spring from Territorial Seed company. The fruit was plump, very red and ripe, and I knew the tomatoes from this particular plant were delicious. The peppers I chose were Anaheim, a variety I have grown many times over the years and are versatile in the kitchen and not terribly hot. Even so, use precautions when collecting hot pepper





seeds and take care not to rub your eyes.

Once you have selected both the plant and the pepper or tomato, the next step is the collection of the seeds. It is possible to simply cut a tomato in half, dry the seeds and stick them in the ground in the spring. But germination rates will not be great. A seed collected in this way maintains a coating that can prevent germination. The better practice is to cut the tomato in half between the stem and blossom end. Scoop the seeds into a jar and add a bit of water. Be sure to label the jar if you are saving more than one variety of seed. Also, I suggest using more tomatoes than you think necessary. My Gill's All Purpose tomato had very few seeds and next time I will plan accordingly.

After a couple of days a white fungus will grow atop the tomato and water mixture. This fungus eats away at the gel coating of the seed and will prevent the seed from sprouting prematurely. Add warm water to this mixture and pour off the pulp and immature seeds. The viable seeds will sink to the bottom. Once the mixture rinses clean, place the seeds on a plate or screen and allow to dry.

Peppers are somewhat easier. If you are only collecting a few pepper seeds, cut open the peppers and dry the seeds on a plate or a piece of screen or cheese cloth. If you are saving lots of seeds, place the seeds and pulp into a blender, add water and blend briefly. The viable seeds are heavier than the pulp and immature seeds and will collect at the bottom. Pour off the top and then screen the rest to dry.

Some sources suggest drying seeds on a paper plate or paper towel. Other sources say the seeds can often stick to the paper and may be damaged as you pry them off. As a beginner I don't yet have an opinion as to which is the preferred method although I have germinated seeds between damp paper towels and had seeds stick to the paper. Consequently I avoided paper in the drying of my limited sample.



Storage is as important a step as any of the first two. Improper storage will spoil the seeds or diminish the viability of the seeds that survive. It is crucial that all moisture evaporates before storing the seeds as any dampness will lead to problems. One way to determine if your seeds are dry enough is to take a pair of tweezers and bend a seed. If it snaps in two it is dry enough. If it bends the seed needs further time exposed to the air.

Store your seeds as you would others you buy. A jar, pill box, wax paper or Tupperware container all serve this purpose. Again, be sure to label your seeds. It is that easy.

I don't know if the peppers I pickle will be as good as the ones my mother stocked in her refrigerator. But I have the confidence now to try and try again as the ability to save seeds of this rare variety of pepper gives me options I never had before. And I know that in time I can develop favorite varieties of tomatoes that are particularly suited to my garden and at a fraction of the cost of gardens past. It is incredibly easy as the accompanying photographs attest. And if you want more information, the following resources may prove useful to you: Yolo Master Gardeners Publication: Tomato Seed Saving, Seed Savers Exchange: <http://seedsavers.org>, University of Minnesota Extension <http://www.extension.umn.edu/garden/yard-garden/vegetables/saving-vegetable-seeds/> 

Botanical Art

Priscilla Ross, UCCE Master Gardener, Yolo County

Before the development of modern photography botanists had to rely on pen and ink, charcoal, or water color drawings to record each new plant they found. The techniques developed by these scientists evolved into a high art form in the nineteenth and early twentieth century. Now there is renewed interest in this art form.

During the eighteenth century, botanical art became more accurate, more clinical and scientific. One of the most famous botanical artists of this time was Georg Dionysius Ehert. His work, unlike earlier plant depictions, emphasized beauty. It also greatly expanded the materials used in botanical art. Oils and water colors made the work much more colorful and beautiful. The eighteenth and early nineteenth century is considered the “golden age” of botanical art. Botanical art of this period was prized by wealthy



Agave americana - Helen Nowens, 1897



Agave americana - Eunic Olsen, 2011

The earliest botanical art was decorative work found on pottery or painted on walls of homes and tombs. The work was predominantly symbolic rather than an accurate portrait of a specific plant. By the time of the ancient Greeks, there were compilations of plant portraits used to identify plants that were of particular interest. These plants were either of economic importance as food and trade goods or for specific medicinal use. The depictions were not what today's viewers would consider natural. They were simplistic, two dimensional and rarely colored.

collectors both in books and as paintings to hang in their homes. Today works of this period are again highly prized, but during the intervening years photographs replaced the demand for fine botanical artwork. Fewer artists did botanical work and most catalogues for plant identification used photographs.

In the last few decades, botanical art has again become popular. Modern work is often much more naturalistic, showing groups of plants in an ecosystem or just part of a plant to emphasize particular features.

Modern botanical art is also much more colorful and dramatic.

The appreciation of botanical art has increased greatly and the number of artists doing botanical work is increasing as well. There are a number of important collections of botanical art. Probably the most well know collector is Shirley Sherwood. Starting in 1990 she became one of the earlier collectors of modern botanical work. Her collections and support for botanical artists have contributed greatly to the renewed interest in this art form. Her collections include works from all over the world and have inspired other collectors and artists. It is currently housed at Kew Gardens in England. (See: <http://www.kew.org/visit-kew-gardens/explore/attractions/shirley-sherwood-gallery-botanical-art>) There are now several books of her collections available.

The American Society of Botanical Artists (ASBA) was founded in 1994 and now has over 1500 members. Today there are numerous national juried competitions of modern botanical art. One exhibition is held at the Filoli gardens here in Northern California. There are also multiple certificate programs to train botanical artists. One of these programs is also at Filoli, with others at the New York Botanical Gardens, the Denver Botanical Gardens, and the desert Botanical Garden in Arizona.

Modern botanical art combines the detail and accuracy of scientific illustration with expressive art. The work requires a thorough understanding of plant structures and life cycle and then an expertise in artistic expression using any number of artistic media.

Modern botanical work is both painstaking and time consuming. It is not intended only for scientific appreciation, but results in work that is a delight to the eye for scientific study and for pure enjoyment of the beauty of nature

Filoli Botanical Art Certificate Program

[Http://www.filoli.org/education/adult-programs/art.html](http://www.filoli.org/education/adult-programs/art.html)

Current Filoli Botanical Art Exhibit August 23 - October 23, “The Valley of Heart’s Delight: A Multi-media Exhibit” 

Our Love Hate Relationship with Clay

Kayla Burns, UCCE Master Gardener, Yolo County

What is clay anyway? Most gardeners have developed some idea of what it means to them. Ask a gardener and you might hear, “Ugh! The clay soil in my yard is why I have raised beds!” Soil scientists, however, have rigid definitions. In fact, in soil science, there are three main meanings for clay: a certain-sized mineral particle in soil, a description of certain soil textures, and a category of minerals in soil. Here you will learn a little about each of these types of clay in more detail and discover why, as a gardener, you may love and hate each of them.

Soils contain mineral particles of various sizes. The smallest sized mineral particles, those less than 0.002 mm in diameter, are called clay particles. This is similar in size to a single bacterial cell or smaller than about half the diameter of a single strand of spider silk. Silt and sand are the larger sized mineral particles in soil, where silt is larger than clay but smaller than sand. Most soils contain at least some clay particles and this is desired for gardening. But why? Because small particles help hold moisture in soil! Without small particles, like clay, water drains out of soil too quickly — think of pouring water through a mesh colander filled with sand. When water is not retained in the soil, it is not accessible to plants. However, with too much irrigation (or precipitation) combined with too much clay, the soil will retain too much water for too long, such that plant roots are not aerated



enough. Still, with low or moderate water content and too much clay, the soil may hold on too tightly to the water, such that plants cannot access it. In moderation, clay-sized particles make up an intermediate textured soil, such as a loam, which has seven to twenty-seven percent clay. Intermediate textured soils have the best water retention for gardening, meaning the water is not held too tightly or drained too quickly for plants to access. Like the expression in *Goldilocks and the Three Bears*, this soil is just right!



Typical Clay Soil

The second use of “clay” in soil science is as a soil texture. Soil texture is a description of the proportions of different sized mineral particles in a soil, like the loam described above. A soil that has a particularly high proportion of clay particles compared to the larger particles, silt and sand, is described to have a clayey or clay texture, depending on the percentages. Clays feel sticky and moldable. In Yolo County, although many soils contain larger amounts of clay particles, most soils are not clay soils by definition. A clay is a soil with more than forty percent clay particles and a balance of silt and sand. If a soil has between twenty and sixty percent clay particles, it can also contain the term clay in its description of soil texture: sandy clay loam, clay loam, silty clay loam, sandy clay, or silty clay. However, only sandy clay, silty

clay, and clay, or soils with more than thirty-five percent clay particles are called “clayey.” The other word or words in each description indicate which other sized mineral particles, sand or silt, are more predominant in each soil. While some clay soils and clayey soils might be entirely unsuitable for gardening, some soils with high clay content may still be productive with the right management. One good use for clay with a particularly high clay particle content is for making ceramics for container gardening!

The third definition of clay is as a clay mineral, also called a secondary mineral, defined as a mineral in soil formed from the chemical weathering of another mineral. They are called clay minerals because they are often clay-sized, but they do not always correspond. This is another kind of clay that a gardener might love, or hate, depending on the particular mineral’s properties. Clay minerals contribute to a soil’s ability to hold onto and exchange plant nutrients. Three of the most important clay minerals in California are kaolinite, vermiculite, and smectite, although there are also many other types. Kaolinite offers the lowest contribution to a soil’s ability to contain and exchange plant nutrients. While smectite has an excellent ability to hold and exchange plant nutrients, it also has a very undesirable characteristic: shrinking in the dry season and swelling in the wet season. In other words, a soil with high amounts of smectitic clay has large, deep cracks when it dries out. Vermiculite, on the other hand, makes a good contribution to holding and exchanging plant nutrients with little shrinking and swelling when water content changes.

So what do you do if your soil has clay in it? First, breathe a sigh of relief because in most cases clay is a normal and good thing! If your soil has too much clay, whether or not it is a clay soil by definition, it is not advisable to try to adjust the soil’s texture. However, adding compost may make the soil more manageable by improving the soil’s tilth over time. Avoid overwatering clayey soils to help prevent water logging and to maintain root aeration. At the same time, avoid under watering clayey soils — otherwise, plants will not be able to access the water. If management strategies prove ineffective, build raised beds to fill with compost or soil from another source. 🍅

Looking for Good News-in the Catalogs

Willa Bowman Pettygrove, UCCE Master Gardener, Yolo County

Maybe it is the long election season, but I have lost interest in news as it comes from the local paper, the radio, television...you get the idea.



Usually, I go to the seed catalogs (my favorites are online), because they are great tools for finding some old standby, or for looking up something that has been recommended to me by another gardener. It isn't really news, but definitely useful information. Why wouldn't I look there for news, too?

SWEET POTATOES: This year I have actual news to report, thanks to information shared by UCCE Master Gardener, Yolo County, Pam Thomas when I griped to her about the difficulty of starting sweet potatoes. Until recently, most commercial sources would not ship the starts to home gardeners in California and some other states. For California home gardeners, the choice was ordering from a few small firms in the Midwest (which seemed to offer a

tremendous variety), or growing one's own from sweet potatoes purchased at a grocery. This didn't always work as planned, even when organic, untreated tubers could be found. No more!

Now major seed companies including Burpees, Gurneys, and Johnny's are selling them and shipping them to California. More commercial sources for sweet potato slips (as the starts are often called) is a good thing. Now all the gardener will need is some good home gardening instructions suited to California's climate. Check the web for other states' Cooperative Extension publications, for example, <https://www.hort.purdue.edu/ext/HO-136.pdf>. My hope is to write a UCCE Master Gardener handout for California gardeners soon. You can read my article, "Life is Sweet (Potatoes)" in the Winter 2012 issue of the Yolo Gardener at http://ceyolo.ucanr.edu/newsletters/The_Yolo_Gardener45143.pdf

GRAFTED VEGETABLE PLANTS: The problem of nematode resistance reappeared with home gardeners' interest in growing heirloom varieties, particularly of tomatoes. For the last couple of years, a few mail order sources have offered heirloom varieties grafted onto nematode resistant rootstocks. The most recent option is multiple heirloom varieties grafted onto one plant. Personal preference will determine whether a gardener wants to go to these lengths and costs to grow heirloom varieties.

Another approach is to try to reduce the incidence of nematodes in the soil. Some preliminary findings suggest that French Marigolds (*Tagetes patula*) grown as a cover crop for three to four months and then incorporated into the soil may be effective. Data to support other remedies, including other cover crops, will require more research.

PELLETED SEED: A water soluble coating around each tiny seed seems made for people who have difficulty with tiny, hard to germinate seeds. For me, the challenging seeds are carrots and scallions. Along with accommodating those who have a hard time seeing or handling tiny seeds, the coatings on pelleted seeds are designed to dissolve with water, which may itself contribute to more even watering. The higher cost of pelleted seed could be justified if the seeds sprouted! I have planted my first "trial" in my plot and don't have any results to report as yet. Only one disadvantage that I've noticed: the pelleted seeds have a bright white coating. This may be

attractive to birds that frequent my garden. I took care to cover the seeds and not to expose them when watering.

ALL-AMERICA SELECTIONS: Since the 1930s, a nonprofit program called All-American Selections (AAS), has been working to identify new plant varieties for the gardening public. Publicly accessible gardens around the US participate in a program of testing and demonstration gardens, which can be quite beautiful. Some of the most popular flower and vegetable seed varieties got their start as AAS winners. My husband and I first saw one of the AAS Display Gardens at the Sundial Bridge in Redding a few years ago. If you like to try new things, you can find out more at <http://all-americanselections.org>. Some of the display gardens in California and elsewhere are maintained on college campuses or by master gardener groups. You might be able to include a visit to one or more of the display gardens in your travel plans next summer. One of my favorite catalogs includes a separate page that lists all the AAS winners offered in their catalog.

A RECORD OF YOUR GARDEN: Another way to be a savvy consumer of news and other things is to know what hasn't worked for you in the past, and what you might like to try instead. I keep the simplest of garden diaries, sometimes just sticking in my tattered notebook the plant labels of the "dear departed" I hope to replace. One of my failures, along with Brussels sprouts, has been parsnips, for the same reason: they have to be planted early, when Davis weather is still too hot for seed planting. This year, I'm trying a variation, new to me, called parsley root (*Petroselinum crispum tuberosum*). I hope this will add parsley flavor to my soups and maybe produce some actual roots to puree.

See? There is good news out there. You just have to know where to look for it.



Gifts for Gardeners

Linda Parsons, UCCE Master Gardener, Yolo County

Many gardeners use the cold winter months to dream and plan their spring and summer gardens. If you have a gardener on your gift list, look and listen for ideas. Are they a beginner gardener who would enjoy a book on general gardening, a year round garden guide, or a special interest book, such as vegetable gardening? Do they need a few basic tools? Perhaps they enjoy garden decorations or wildlife? Every gardener needs a pair of garden gloves, a hat and a garden tote. There are so many choices, from a hand lens to a wheelbarrow!

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Tools

A quality pair of bypass pruners is a gift that will be enjoyed and last for years. Select a pair that are properly sized for their hand. Some pruners come with a holder or sheath. Another good choice is a hand or lawn rake that has collapsible tines, which allow the gardener to get into narrow and wide spaces easily. A favorite tool of mine is the Hori Hori Japanese digging tool, which performs many functions, including digging, cutting and weeding. A tool that any gardener can use is a pocket tool sharpener or perhaps a hand lens.

Tool Caddies

What gardener can keep track of their tools? I prefer a garden tote with a variety of pockets or spaces to accommodate gloves, pruners, trowels, garden twine, small loppers, and shears. If your gardener likes to travel



light, there are a good variety of tool belts to hold just what is needed.

Decorations and Wildlife

If your gardener enjoys wildlife through the year, a birdbath, feeder, or birdhouse would be fun. Keep in mind that some feeders are specific to small birds or hummers. Garden art can come in the form of practical and whimsy. Would your gardener enjoy a sundial or a set of little toads or bunnies? A set of solar garden lights or a trellis for climbing peas or roses are always useful.

Containers

Does your gardener have a small garden space or porch? Do they enjoy flower arranging? A set of garden containers, a hanging basket, window box, seed saving kit, or a colorful vase are all appreciated. You might consider making some of these by using repurposed containers, baskets and boxes with a few items from your craft store.

Plants

There are winter plants that are traditional gifts, such as poinsettias, but for something different, you can order a special plant from a nursery catalog, and they will send the plant at the appropriate planting time. After ordering the plant, cut out a picture of the plant and enclose it in a pretty card or box for gifting. You can also cut out a photo of a plant or two in your garden. Add a note telling when you will propagate, divide or scoop up this plant and deliver it to them with instructions for planting and care in their garden. A basket of a few small herb pots is a refreshing gift for the kitchen counter and can be transplanted into their garden. A favorite of mine is placing five to seven paperwhite bulbs in a clear or frosted, low glass vase in November. The bulbs will begin to grow. In order to have them ready for gifting in December you can speed up their growth by placing them indoors or slow them down by placing them on your patio. Add a bow or decoration to make it festive.

Printed Materials

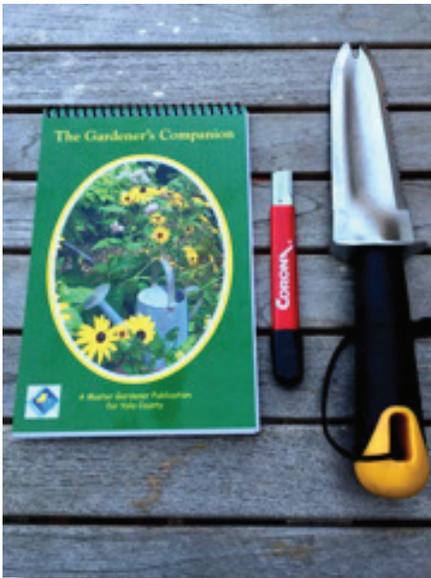
Garden calendars, with a wide variety of garden themes, from landscapes to edibles and ornamentals, are a wonderful year around gift. If you know your gardener's interests, you could select a special garden book which introduces or expands their knowledge on a favorite topic. Many gardeners enjoy visiting gardens. Books that feature gardens and garden destinations are perfect for travelers. Two, which are on my gift list are, *The Visitor's Guide to American Gardens: Garden Walks, Garden Talks and Garden Events* by Jo Ellen Sharp and *The National Geographic Guide to American Public Gardens* by Mary Jenkins.

Who doesn't enjoy something fun in the mail? A monthly or quarterly garden magazine makes any gardener smile. It is easy to do a web search for specific topics, such as roses, wildlife, landscaping or garden societies. A good general magazine would be *The American Horticultural Society*. If your friend lives in Yolo, or Solano, *The Gardener's Companion*, which was authored by our UCCE Master Gardeners in Yolo County, is a lasting gift for year around gardening and also serves as a personal garden journal. It can

be purchased for \$18 from the UCCE office at 70 Cottonwood, Woodland, CA or at the upcoming Woodland Community College plant sale on October 8 and October 15.

Big Tools

A hand truck is very handy and a back saver if you often lift large pots, and bags of compost and manure. It can be adjusted to pull items horizontally or vertically with a simple adjustment.



Many cities have adopted curbside garden bins. We received our garden bin over a month ago and have come up with an easy remedy to placing garden debris in the bin. We scoured the internet and found an Apple Picker Muck Truck. It holds a very large Muck or Apple Bucket that is easy to remove to deposit garden debris in our bin. We purchased two buckets for ease and efficiency. We'll save our wheelbarrow for monthly and seasonal street pile pick ups.

Gift certificates

If you can't decide on the perfect gift, a certificate for a garden store or website is always appreciated. You can make a donation in their name to a public garden, such as Central Park Gardens of Davis or the Uc Master Gardeners. Another type of certificate is a promise type that you create. You can give the gift of time in their garden. Offer to help on a future garden project. You can promise to take your friend to a favorite garden, park or garden shop. Include lunch and make a memory together.

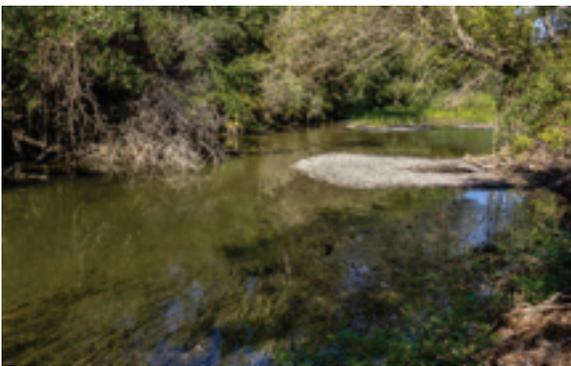
Finally, if you are creative and have the time, you can make some truly beautiful and practical gifts to give your gardening friends. Whether you are the creative type or enjoy searching for the perfect gift, your ingenuity is all that is required to put a smile on a gardener's face. 🍅



Muck Bucket

The Putah Creek Reserve – A Green and Somewhat Wild Oasis on the UC Davis Campus

Michael Kluk, UCCE Master Gardener, Yolo County, Bonnie Bradt, UCCE Master Gardener Nevada County



Putah Creek (Photo by Jim Hill)

You are probably familiar with the UC Davis Arboretum that runs along the banks of the old channel of Putah Creek in the UC Davis campus proper. But you may not know about its wild sibling to the west, the Putah Creek Reserve. Consisting of 770 acres, the Reserve has multiple sections. The most popular and accessible extends for three and a half miles along the south side of the original channel of Putah Creek between Old Davis Road and Pedrick Road. A well maintained trail transverses the entire distance and there is parking at each end. Flowing east from the coastal mountains, Putah Creek is a true success story and the Reserve deserves credit for being part of that transformation. Cleaned up and with adequate flows now assured coming out of

Lake Berryessa, it meanders through leafy green corridors on its way to the Sacramento River. It is a reminder of the gentle beauty that could be seen everywhere in creeks crisscrossing the Valley in years past. And now, if you come in December and January you may even see salmon spawning while walking the trail along the creek.

Reserve staff and volunteers are actively controlling and removing invasive species along Putah creek and developing a native plant nursery so that there will be a wide variety of species available to put in their place. They have also taken responsibility for habitat restoration in several large tracts in the more rural areas of the Davis campus to establish hedgerows, reduce invasive plants, reintroduce native species, and increase habitat for insects, birds and mammals. The overall goal is to maintain the area for students and researchers to study the natural systems of Putah Creek and surrounding areas and to encourage public use and enjoyment consistent with sound environmental stewardship.

The Reserve is part of the Arboretum and Public Gardens unit. It was established by the University in 1983 but did not have full-time staff assigned to it until 2002. Currently there are two full-time staff, a group of student interns and a small handful of volunteers who do their best to keep on top of all of the varied tasks that compete for their time.

The Look Forward

The Reserve staff and volunteers are currently focused on keeping invasive plants in check, slowly eliminating them where feasible and planting native species. The go-to approach in the portion of the Reserve that borders the creek is manual control. Invasive species prevalent along the creek include the bamboo-like Arundo or Giant cane (*Arundo donax*), tamarisk or saltcedar (*Tamarix* sp.), ubiquitous eucalyptus (*Eucalyptus* sp.), Tree of Heaven (*Ailanthus altissima*) and, of course, Himalayan blackberry (*Rubus armeniacus*). When herbicides are used, they are generally painted on cut stumps, reducing the chance of pollution of the waterway and resulting in much better control than cutting alone.



Homes for Western Bluebirds (Photo by Jim Hill)

One project involves establishing a wildlife corridor north of the creek by planting a hedgerow along Hopkins Road. The hedgerow will consist of native trees, shrubs and grasses. Currently planted are, among others, valley oaks (*Quercus lobata*), native sycamore (*Platanus racemosa*), coyote bush (*Baccharis pilularis*), California lilac (*Ceanothus* sp.) coffeeberry (*Frangula californica*), California buckwheat (*Eriogonum fasciculatum*), bluegrass (*Poa secunda*), purple needle grass (*Nassella pulchra*) and creeping wild blue rye (*Leymus triticoides*). Reserve staff members also plan to plant a few non-native fruit trees in the hedgerows, feeding pollinators, birds, small mammals and the odd browsing hominid.

They have also taken over management of a small olive orchard, planting legumes such as lupine (*Lupinus* sp.) and vetch (*Vicia* sp.) between the rows to increase the nitrogen in the soil naturally, and flowering natives such as California poppy (*Eschscholzia californica*) to attract pollinators to the olives. Last year this small orchard produced three tons of olives that were harvested and pressed into oil that was shared with volunteers who helped with the harvest.

Another integrated approach has Reserve staff members becoming part-time cowboys, using cattle to optimize the health of grassland habitats through managed grazing. Grasslands evolved in conjunction with large herbivores. Research has demonstrated that when managed correctly, the presence of grazing animals can quickly restore soil fertility and enhance the diversity and overall health of grasslands.

Reserve staff members have expanded the activities they focused on over the past few years. Originally concentrating on the area adjacent to Putah Creek they have now taken on additional areas where they saw an opportunity to improve environmental management. The UC Davis airport that lies just north of the creek is a good example. A few years ago, the area between the runways was sprayed with herbicides by grounds staff. But poor timing of the applications resulted in less competition for invasive species such as tumbleweeds (*Salsola tragus*.) These may be picturesque in old westerns but are definitely a bad idea when they start rolling across runways. In addition, polluted runoff from the airport made its way into Putah Creek, resulting in the University being fined by the EPA. Reserve staff implemented a simple but effective solution. They first controlled invasive plants, including the



Bee Nests (Photo by Jim Hill)

tumbleweeds, with properly scheduled applications of herbicides. Next they planted annual rye grass. The grass has effectively out-competed the invasive plants, significantly reducing the need to spray herbicide. It also traps the runoff, eliminating pollution of the creek. There are plans eventually to try to transition to perennial grasses native to California. This demonstrates an approach you can use in your own yard. Whether you use manual control of invasive species or turn to herbicides, you must replace the unwanted species with strong competitors that you prefer. Otherwise, the bad guys will just come back in short order.

The Reserve staff have also taken responsibility for several water catchment “ponds.” These are designed to hold rain water from roads and fields, allowing it to sink into the ground instead of running off. But they were previously managed by the Grounds Division primarily through applications of herbicides. They were essentially bare earth. The Reserve staff have begun to plant water loving trees; cottonwood (*Populus* sp.) and poplar (also *Populus* sp.), shrubs; saltbush (*Atriplex* sp.), mule fat (*Baccharis salicifolia*) and native grasses that, in time, should turn them into an oasis of green that will be attractive, more environmentally sound, provide habitat for wildlife, and greatly reduce the need to regularly spray herbicide.

Finally, Reserve staff members and volunteers are working to increase animal diversity. Hedgerows not only help prevent wind and water erosion but also provide food and cover for many animal species. They have also increased stands of mule fat and saltbush are because they provide good cover for California Quail. Nesting boxes for Western Bluebirds and Tree Swallows are being installed and raptor perches are going up. In the greenhouse, four hundred narrow leaf milkweed (*Asclepias fascicularis*) starts are waiting to be put out to provide food for monarch butterfly larvae. Similarly, pipevine (*Aristolochia macrophylla*) has been planted to serve as a food source for the larvae of the Pipevine Swallowtail. Nesting boxes to attract native bees have also been set out.

Active Management

The Reserve implements “active management” in the areas for which it is responsible. It rejects formula approaches such as spraying herbicides on a strict schedule without observing the growth stage of weeds to be controlled. It emphasizes flexibility and response to circumstances as they change. It acknowledges that good stewardship requires patience, time and proceeding in stages. Done properly, the process of reducing unwanted plants will take three to five years. While it is not feasible to manage the entire Reserve without the use of herbicides given the staff time available, the Reserve seeks to minimize the use of herbicides by timely application. If applied after the second or third rain in the fall, when weeds are young, glyphosate (Roundup) can be applied at fifty percent of the recommended rate and still obtain good control. Timing is everything. If spraying is delayed for a couple of weeks, the application rate must be increased. That approach, along with mowing annual grasses before seeds mature to at least reduce the seed load can, in time, result in good control of undesirable species. Coupled with planting of desirable species, the goal is to bring about 90% control of invasive species. At that point, they can be controlled manually most of the time.

Conclusion

The Putah Creek Reserve encompasses unique, varied and beautiful portions of the UC Davis Campus. It provides academic staff and students with an opportunity for observation of natural systems and research. The Reserve is open to visitors throughout the year for hiking, jogging, bird watching, picnicking, and just hanging out. Applications to volunteer for the Reserve are accepted each January. You can get more information on-line at <http://putahcreek.ucdavis.edu/> or by calling the Arboretum and Public Garden at 530-752-0763. 🍅

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Fall Garden Tips

Peg Smith, UCCE Master Gardener, Yolo County

Fall/Autumn is one of my favorite times in the garden but it is a time in the garden when the old adage ‘an ounce of prevention is worth a pound of cure’ rings true. If a gardener takes the time to collect old fallen fruit; manage dormant care tasks for fruit trees; trim branches that may break with winter’s wind; clean out old vegetables and annuals; cover crop or plant a winter vegetable garden, and plant drought tolerant perennials the spring reward is a garden that has not added to your problems. With these tasks you will have reduced potential diseases, improved the soil and added to the array of plants to attract beneficial insects to the garden.

Now is the time to wander through your garden and see where you would like to make changes or add to your garden palette. I think of a garden as a constantly renewing and changing painting where a gardener can adjust and refresh the color and show each season.

Fall is the best time to plant new perennials, shrubs, and trees that can be purchased from the many local plant sales. This is a time to remove plants that have struggled in the drought and replace them with a more water-wise, low-maintenance landscape. Consider planting some drumstick alium, *Allium sphaerocephalon* for next year’s holiday decorations from the garden they dry beautifully for arrangements.

If your lawn is struggling and you plan to replace it with a more waterwise perennial landscape the *How to Remove Your Lawn* ucanr.edu/sites/YCMG/files/187332.pdf gives step by step directions.



Don’t give up on the vegetable garden! Yolo county winters allow for a year round vegetable garden. Check out our Master Gardener year round vegetable planting guide and choose your favorites to plant and enjoy the home grown produce through the holiday season. Vegetable Planting Guide <http://ucanr.edu/sites/YCMG/files/206763.pdf> Take a look at the Yolo County Master Gardener Free Publications for additional information on gardening topics. <http://ucanr.edu/sites/YCMG/MoreInfo>



Garden Books

Consider starting your own ‘Garden Book.’ It doesn’t need to be fancy, just to keep a record of the transitions and your experiences in the garden. What and when you planted; did you like the plant in each season; did it produce flowers or fruits well; what problems did you have with insects or disease; what did you do to control the insects or disease; did the dog like to dig it up or lie under it?

A good start for garden record keeping and year round garden information is the *The Gardeners Companion* (price \$18) produced by the Yolo County Master Gardener program and specifically written for Yolo County. It is available by visiting the UCCE-Yolo office at 70 Cottonwood Street, Woodland. Monday through Friday from 8AM -Noon and 1:30-5PM. Or by attending our Plant Sales at Woodland Community College October 8 and October 15 from 9:00 AM – Noon.

The Autumnal Equinox falls on Monday, September 22, at 7:21AM PDT. If the weather is kind take a picnic to one of our local parks. The website <http://www.yolocounty.org/general-government/general-government-departments/parks> will give you directions and details of amenities for all of the Yolo County Parks.

As a reminder, time falls back one hour on Sunday, November 6, at 2:00 a.m.

Fall Cleanup

- Remove fallen fruits, vegetables, leaves, spent flowers, and weeds.
- Pinch back plants to allow tomatoes, melons, and squash enough time to mature before frost sets in.
- Remove unproductive plants.
- Take down squash, melon cucumber and tomato supports. Get them ready for pea planting in October.
- Clean garden supports and stakes with a diluted bleach solution before storing them for future use.
- Pick tomatoes when daytime temperatures no longer exceed 65° F. Wrap them in newspaper and let them ripen indoors.
- Maintain your compost pile by adding clean garden waste and leaves.
- Control earwigs, snails, and slugs.
- Apply liquid copper to citrus to prevent brown rot.
- Apply the first dormant spray to fruit trees in November.
- Apply the first round of liquid preventatives to nectarines, peaches, and apricots in November.

For Peach leaf curl - <http://ipm.ucanr.edu/PMG/PESTNOTES/pn7426.html>

For Brown rot - <http://ipm.ucanr.edu/PMG/GARDEN/FRUIT/DISEASE/aprbrownrot.html>

For Shot hole - <http://ipm.ucanr.edu/PMG/GARDEN/FRUIT/DISEASE/shothole.html>

Fertilize and Amend

- Fertilize and amend your garden soil. Add manure and compost to improve soil structure and fertility.
- Apply a layer of leaves, straw, or newspaper to your soil surface to reduce weeds next spring and improve soil structure.
- Amend your soil and add a complete fertilizer if you plant winter crops, flowers, bulbs, or seeds.
- Consider planting a crop of green manure on any open ground to loosen the soil and add nitrogen before planting in the spring. <http://ceyolo.ucdavis.edu/files/53466.pdf>

Lawn care

- Renovate a poorly performing lawn by de-thatching, aerating, fertilizing, and over-seeding it with either an annual or perennial rye or fescue mix, which will keep it green through the winter.
- Fertilize lawns in early fall with a pre-emergent and a complete fertilizer (one that contains nitrogen, phosphorus, and potassium).
- Fertilize in late fall with a slow-release complete fertilizer, such as one labeled “winterizer.”
- Adjust the watering cycle on your lawn. It will require less water in the fall and little or none in the winter.
- Continue to mow weekly and check your sprinkler system. Be sure it is properly adjusted and that all the nozzles are working.
- Remove dead leaves from your lawn regularly to prevent your lawn from expiring from lack of sunlight or from contracting fungus infections.
- Fall is the best time to put in a new lawn with either seed or sod.
- For complete lawn care see UC IPM Healthy Lawns at <http://www.ipm.ucdavis.edu/PMG/menu.turf.html>

Annuals and Perennials

- Continue deadheading and removing unsightly leaves.



- Divide and transplant bulbs, tubers, and corms.
- If your oriental poppies, bearded iris, peonies, agapanthus, and daylilies are becoming less vigorous and more unattractive, fall is the season to divide and replant them.
- Share extra bulbs, corms, and tubers with a friend.
- Enjoy the fall color of perennials. Wait until spring to trim or cut them back.
- Evergreen perennials should not be cut back in the fall. These include rock cress, creeping sedum, creeping phlox, and hens and chicks.
- Roses should keep producing flowers into December, but do not fertilize after September. Deadhead as needed unless you prefer colorful rose hips to develop and provide winter interest.
- Plant fall flowers such as calendulas, chrysanthemums, bachelor buttons, dianthus, forget-me-nots, sweet peas, primroses, and violas. Many of these will over-winter and provide lush color in the spring.
- Spring-blooming perennials such as foxglove, columbine, salvia, and daylilies can be planted now. Combine these with daffodils, freesias, tulips, and other spring bulbs, which should be planted no later than the end of October.
- Fall is the best time to introduce perennials to your garden.
- Plant winter vegetables such as broccoli, lettuce, endive, parsley, garlic, and onion sets now.
- Take cuttings of your favorite annuals. Favorite choices are geraniums, coleus, begonias, and impatiens. Gradually move plants to shadier locations so they will adjust to the lower light levels when you move them indoors.



Trees and Shrubs

- Fall is the best time to plant trees and shrubs.

Suggested Trees for Yolo County <http://ucanr.edu/sites/YCMG/files/181041.pdf>

Problem Trees for Yolo County <http://ceyolo.ucdavis.edu/files/53031.pdf>

How to Plant Tree <http://ceyolo.edu/sites/files/53455.pdf>

Watering and Drought Care of Trees <http://ucanr.edu/sites/YCMG/217955.pdf>

The cooler air temperature and still-warm soil provide ideal conditions for new plant roots to take hold.

- For autumn colors of red, gold, or yellow, choose these trees: Chinese pistache (*Pistacia chinensis*), ginkgo (*Ginkgo biloba*), tupelo (*Nyssa sylvatica*), scarlet oak (*Quercus coccinea*), red oak (*Quercus rubra*), chanticleer pear (*Pyrus calleryana* “chanticleer”), or red maple (*Acer rubrum*).

- Plant drought-tolerant trees such as valley oak (*Quercus lobata*), blue oak (*Quercus douglasii*), or a Japanese pagoda tree (*Sophora japonica*). A new favorite

is the Chinese Fringe Tree (*Chionanthus retusus*).

- Apply manure and compost to help your trees emerge from dormancy with lush leaves and flowers.
- Plant easy-care and drought-tolerant shrubs such as crape myrtle (*lagerstroemia* sp), California lilac (*Ceanothus hybrids*), heavenly bamboo (*Nandina domestica*), tobira (*Pittosporum tobira*), and Western redbud (*Cercis occidentalis*).
- Prune and shape trees in late fall.

Garden Keeping

- Sharpen spades, loppers, pruners, and your lawn mower blade. You can use a file or take your tools to a professional sharpener.
- Take your lawn mower to a professional for an annual tune-up.
- Clean, disinfect, and oil your tools, so they will be ready for pruning roses, trees, and shrubs from late fall to early spring.
- Keep birdbaths and feeders clean and full for migrating birds.

- Check out your local farmer’s market or pumpkin patch for a colorful selection of fall decorations, including pumpkins, gourds, dried corn, and fall flowers.
- Keep a journal. Record your watering cycle information, pruning, spraying, and planting information.
- Make a list of garden improvements and fun ideas.
- Collect seeds from your garden.
- Check out your favorite garden catalogs. It is time to think about ordering next spring’s seeds, bare root roses, and garden tools.
- For more information on vegetables, ornamentals, fruit trees, and lawn care, visit <http://www.ipm.ucdavis.edu>.

Garden Fun

- Make a fall wreath and table decorations from dried or fresh garden cuttings. Use a hollowed-out pumpkin or gourd as the vase.
- Plant spring bulbs for a fresh look come March or April after we have a rainy winter.

Fun Fall Events

- Public Education, Davis Public Library: Water-wise topics, once a month on September 18, October 16, and November 20, from 2:00 p.m. to 4:00 p.m.
- Sacramento Farm-To-Fork Festival 2014 (<http://www.farmtofork.com>): Activities and events September 8-24.
- Check for UC Davis Arboretum events (<http://arboretum.ucdavis.edu/calendar.aspx>):
- Fair Oaks Horticulture Center Open Garden (http://ucanr.edu/sites/sacmg/Plant_Clinics): September 17 and October 12.
- UCCE Master Gardener, Yolo County, Plant Sale and Garden Talks at Woodland Community College: October 8, and October 15, 9:00 a.m-1:00 p.m.
- UCCE Master Gardener, Yolo County, Plant Sale and Workshops at Woodland Community College: October 4, 9:00 a.m-1:00 p.m. Seed Saving Workshop: 9:30 a.m; TBD workshop: 11:00 a.m.
- Hoes Down Harvest Festival presented by Fully Belly Farm (<http://www.hoesdown.org>): October 1&2. Check website for location, costs, and times.
- UC Davis Arboretum Plant Sale (<http://arboretum.ucdavis.edu>): October 1 and October 22 and November 5.



*Questions about your garden?
We’d love to help!*

UCCE Master Gardener, Yolo County Hotline..... (530) 666-8737

Our message centers will take your questions and information. Please leave your name, address, phone number and a description of your problem. A Master Gardener will research your problem and return your call.

E-Mail..... mgyolo@ucdavis.edu

**Drop In..... Tuesday & Friday, 9-11 a.m.
70 Cottonwood St., Woodland**

Web Site <http://yolomg.ucanr.edu/>

Facebook..... UCCE Master Gardeners, Yolo County

UCCE Master Gardener Events in Yolo County



UCCE YOLO COUNTY MASTER GARDENER PUBLIC WORKSHOP SCHEDULE AUGUST - DECEMBER 2016

Dates and times subject to change.
Please check at <http://yolomg.ucanr.edu/> for updates.
All workshops are open to all members of the public and are free.
Workshops are held in several different venues.
Check the venue address for those in which you are interested.

DAVIS

Date	Time	Topic	Venue
Saturday, October 15	9:00 – 10:00 AM	Fall Maintenance & Vegetables	Grace Garden ***
Saturday, October 15		Bulbs and Corms	ACE****
Sunday, October 16	2:00 – 4:00 PM	Caring for your Perennials Time to Plant Garlic and Onions Fruit Trees , Winter Pruning and Spraying	Davis Library**
Saturday, October 22	9:30 – 10:30 AM 11:00 AM - Noon	Landscaping and Creative Design with Succulents in the Garden and for Gifts Keep Your Rainwater for Yourself: Rainwater Collection and Water Retaining Landscaping Ideas for the Garden	CPG*
Sunday, October 23	2:00 – 4:00PM	Year Round Kitchen Gardening	Davis Library**
Saturday, November 12	10:00 – 11:00 AM	Flower Arranging	Grace Garden***
Saturday, November 5	9:30 – 11:00 AM	Dormant Season: Pruning, Pest Control, Frost Protection and Winter garden Practices	CPG*
Sunday, November 20	2:00 – 4:00 PM	Preparing for Bare Root Trees and Vines Planting Edibles in Your Landscape	Davis Library**

*CPG (Central Park Gardens) at the corner of 3rd and B Streets in Davis, 95616

**Davis Library (Davis Branch of Yolo County Library), 315 E 14th Street, Davis 95616

*** Grace Garden 1620 Anderson Road, Davis, CA 95616. (At the back of the church parking lot.)

**** ACE 240 G Street Davis, 95616

WOODLAND

Date	Time	Topic	Venue
Saturday, October 1	9:00 – 10:00 AM	Incorporating Native Plants Into a Drought Tolerant Garden	WCC*
Saturday, October 8	9:00 – 9:45 AM 10:00 – 10:45 AM 11:00 AM - Noon	Bulbs and Corms Landscape Design with Drought Tolerant Crops Grafting Fruit Trees in Your Yard	WCC*
Saturday, October 15	9:00 – 9:45 AM 10:00 – 10:45 AM 11:00 – 11:45 AM	Floral Design/Halloween Arrangement Creating Your Own Bonsai Growing Plants Using Hydroponics	WCC*
Saturday, November 12	9:00 – 10:30 AM	Backyard Composting and Worm Composting	WCC*
Saturday, November 19	9:00 – 10:00 AM	Floral Design/ Thanksgiving Arrangements	WCC*
Saturday, December 17	9:00 – 10:00 AM	Holiday Arrangements (Attendees: please bring a vase in which to make your arrangement)	WCC*

*WCC (Woodland Community College) 2300 E. Gibson Road, Woodland, 95776

ESPARTO

Date	Time	Topic	Venue
Thursday, October 13	6:30 – 7:30 PM	Floral Arranging	Esparto Library*

*Esparto Regional Library 17065 Yolo Ave., Esparto, 95627



U.C. Cooperative Extension
UCCE Master Gardeners of Yolo County
70 Cottonwood Street
Woodland, CA 95695

The Yolo Gardener - Fall 2016

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70 Cottonwood St.
Woodland, CA 95695

STAFF

Jim Fowler, Managing Editor
Jennifer Baumbach, Editor
Willa Pettygrove, Editor
Kathy Polkinghorn, Editor
Jim Fowler, Layout



WRITERS

Bonnie Bradt, Kayla Burns, Jack Kenealy, Michael Kluk, Linda Parsons, Willa Bowman Pettygrove, Kathy Polkinghorn, Priscilla Ross, Peg Smith,

PRODUCTION

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<http://yolomg.ucanr.edu/>

Jennifer Baumbach, UCCE Master Gardener Program
Coordinator Yolo and Solano Counties