THE YOLO GARDENER

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A Friendly knock on the Door

Peg Smith, UCCE Master Gardener, Yolo County

One day recently the doorbell rang. After answering the door I was introduced to an employee of the CDFA (California Department of Food & Agriculture) who was conducting a survey of citrus trees to see if there was any evidence of Citrus Greening Disease (Huanglongbing – HLB disease) on my citrus trees - but let's take a step back.

At this point we are probably all familiar with the warnings about West Nile Virus being transmitted to humans via mosquitos, this is an example of insect to human pathway for disease. There are also insect to plant pathways to disease that we as gardeners need to be aware of for our gardening practices.

Asian Citrus Psyllid

Citrus Greening Disease is transmitted by the Asian citrus psyllid, *Diaphorina citri* a mottled brown insect about the size of an aphid. It feeds on newly developed leaves but of much greater concern is if the Asian citrus psyllid has fed previously on a tree infected with Citrus Greening Disease (HLB) it will have taken up the bacteria (*Candidatus* Liberacter asiaticus) that causes the damage of Citrus Greening Disease. An infected tree can die within five years and at this point in time, there is no cure. As the insects move from tree to tree carrying the bacteria the disease is transmitted through neighborhood citrus and orchards.

The Florida citrus industry has been devastated by Citrus Greening Disease (HLB). At the present time, this disease is more prevalent in Southern California but has been found in isolated pockets in the Central Valley and the Central Coast. The Asian citrus psyllid was first seen in Southern California in 2008 and the first infected tree was found in a home garden in March of 2012. By 2017 the disease had spread rapidly through Orange and Riverside Counties.

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UC CE University of California Agriculture and Natural Resources Cooperative Extension

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Citrus Greening Disease (HLB) can be transmitted by the Asian citrus psyllid but can also be transmitted by grafting from a diseased tree to a non-affected tree. This is thought to be the introductory pathway for the first disease sample into Southern California.

As gardeners what can we do to inform and educate our neighbors, friends, and family?

The more awareness of the problem of Citrus Greening Disease the more contained it will be.

The best approach is to keep the problem as isolated as possible by not transporting citrus products or plant material (especially from Southern California) from place to place. Don't do home grafting from great aunt Bessie's lovely tree in Southern California to your tree in Yolo County. Welcome the CDFA survey people when they come to your neighborhood. The CFDA representative in our neighborhood was a great source of information and best gardening practices. Vigilance will pick up early problems that will help reduce the impact on California's wonderful citrus orchards and backyard trees.

Biological Controls

There are some natural predators of the Asian Citrus Psyllid: parasitic wasps kill psyllid nymphs; lady beetle adults and larvae, lacewing larvae, and pirate bugs will consume adult psyllids, also spiders, birds, and other general predators will consume adult psyllids.

Ant control is very important around backyard citrus. The honeydew produced by the psyllids is fed by the ants to their young. To preserve this source of nutrition for their young ants will defend the psyllids from predators. Good ant control is important.

As a team of gardeners, we can make a difference!

To learn more the UC Davis IPM (Integrated Pest Management) website is a wonderful resource for home gardeners ipm.ucanr.edu.

For more information on ant control (http://ipm.ucanr.edu/PMG/PESTNOTES/pn7411.html) and Citrus Greening Disease (HLB) (http://ipm.ucanr.edu/PMG/PESTNOTES/pn74155.html).

Sharing Citrus? Sacramento Still Under Oriental Fruit Fly Quarantine

Karey Windbiel-Rojas, Associate Director for Urban & Community IPM/ Area IPM Advisor
UC ANR: Integrated Pest Management

I enjoy sharing backyard citrus and produce as much as anyone. Unfortunately, as backyard citrus trees start to overflow with their bounty and we are of course in the giving and sharing spirit, I have to remind everyone who lives in certain parts of Sacramento County (https://maps.cdfa.ca.gov/QuarantineBoundaries/OFF/OFF_169.pdf) that the Oriental fruit fly quarantine is still in place.

I called the California Department of Food and Agriculture today to check on this, and they responded that no, the quarantine has not yet been lifted and may not be for several more months.

The Oriental fruit fly (https://www.cdfa.ca.gov/plant/factsheets/OFF_FactSheet.pdf) is an invasive insect pest that can cause devastation to several hundred crops, leading to serious crop and economic damage. Fresh fruit, vegetables and other plant material should not be moved from one's own property but should be

consumed or prepared (cooked or processed) on site. Plant material is safe to eat and there is no concern about diseases or other contamination.

While you might think, "well, I don't see any flies on my fruit", the eggs and larvae could be on or under the fruit or vegetable skin/peel and go unnoticed.

Remember these are not the common fruit flies that you might find on overripe fruit in your kitchen. These flies are a little larger and feed on a wider range of healthy fruits and vegetables.

If you live within the quarantine zone, please help limit the spread of this invasive and potentially damaging pest by not moving plant material off your property. If you have any questions, please call the CDFA pest hotline (https://www.cdfa.ca.gov/plant/reportapest/).

Have Leaves?...Make Compost!

Michael Kluk, UCCE Master Gardener, Yolo County

Compost is the best soil amendment a gardener can use. It helps to break up clay soils, improves the moisture holding capacity, feeds beneficial soil bacteria and fungus and adds a few nutrients. Fallen leaves are an excellent starting point for making great compost. Gardeners should consider them a valuable resource, not a disposal problem. While compost can be purchased in bags or bulk, the version you make yourself is generally of much better quality. When nature gives you leaves, make compost.

Composting Basics

Compost is the organic matter that has been decomposed by micro-organisms, mostly bacteria, helped along by the digestive systems of some macro-organisms such as worms and sow bugs. Making good compost requires the right balance between “carbon” and “nitrogen.” All organic plant matter has both but in different proportions. Carbon provides an energy source for the micro-organisms that do the decomposing work and is incorporated into their bodies. Nitrogen is necessary for cell growth and a primary component of the metabolism of composting bacteria. As it turns out, the best ratio is thirty parts of carbon to one part of nitrogen. If there is substantially more nitrogen, it will combine with hydrogen forming ammonia and the resulting bad odors. If there is too much carbon to nitrogen, the growth of the decomposing organisms will suffer, slowing the composting process to a snail’s pace.

The other elements necessary for the most efficient composting are moisture, oxygen, and relatively small pieces of organic matter. Moisture is necessary for the composting micro-organisms to flourish. Oxygen supports aerobic micro-organisms, varieties that compost faster and with fewer bad smells than those that can live in low oxygen environments. Smaller pieces of composting materials provide the micro-organisms with more surface area on which to work their composting magic. There are two basic ways for making compost; composting in place and pile composting

Composting in place is so basic and simple it seems like cheating. It works well because most leaves when they fall from the tree, are essentially at that ideal 30:1 carbon to nitrogen ratio. They are generally wet from fall and winter rains, don't form such a thick layer that oxygen is excluded, and present a large surface area. So, you can just leave them where they fall, and, in time, they will simply decompose and enrich the soil. This is the nutrient recycling process that supports all plant life although you may understandably not want leaves covering your lawn.

Fall leaves are a resource, not a problem.

There are a few things you can do to tweak the process, making it more practical in your yard. Fallen leaves make an excellent mulch – a layer of organic matter placed on the soil surface to protect it and, in time, feed it. A few inches of leaves placed around your trees and perennial plants will improve the underlying soil as they slowly decompose. Covering them with an inch or so of finished compost will help to preserve moisture content and give it all a more attractive look.

Alternatively, you can save leaves to use as mulch in your vegetable and annual flower garden in the summer. If you choose this approach, it is probably best to make a pile and cover it with a tarp to let them dry out. A large pile of leaves that is rained on regularly will become anaerobic, without enough oxygen to decompose efficiently resulting in a fairly slimy mess. Once dried, they will be higher in relative carbon because much of the nitrogen will have volatilized into the air, but they will still make an exceptional mulch that will decompose slowly.

Pile Composting

The traditional composting approach is to make a compost pile. This has some advantages over composting in place – primarily as a more efficient way to make a lot of compost. And you can incorporate other compostable materials such as kitchen scraps and grass clippings in addition to collected leaves.

If you collect freshly fallen leaves before they dry, you can simply build a pile with them since they have that good carbon to nitrogen ratio. You will need to stir them up well at least once a week or so to incorporate enough oxygen. If you have access to a shredder that will cut them into smaller pieces, all the better. A gas lawnmower will also work; simply run over leaves in a two to three-inch layer. Cut up they will compost much faster but that is not absolutely necessary if you are patient. Be sure to keep them damp but not wet. It is best to keep them in a covered composting bin or under a tarp so that a wet spell does not saturate them, reducing the oxygen in the pile too much. Composting is relatively slow in the winter because cooler temperatures slow bacterial decomposition, but it does work.

Alternatively, if you have leaves that fell and dried or if you collect them and protect them from the rain so that they dry, they will be relatively higher in carbon because the nitrogen will have departed. Now you can use them to build a more traditional compost pile that mixes "browns," high carbon dry organic matter, with "greens," fresh organic matter such as vegetable scraps, coffee grounds, grass clippings and, fresh manure that are higher in nitrogen. Conveniently, equal amounts of browns and greens give something close enough to the 30:1 carbon/nitrogen ratio you are shooting for. You can build your pile in layers as you have greens, pulling from your pile of dried leaves. If you run out of dried leaves, straw and even some amount of newspaper are common high carbon additions. Be sure to wet the dry ingredients as you build your pile, keeping it as damp as a wrung-out sponge. You should also stir your pile at least weekly to keep it well oxygenated.

At some point, you will need to stop adding fresh material to your pile so that it can mature into finished compost. Simply turn it from time to time and keep it damp while you start a new pile.

Some (Bacteria) Like it Hot

One of the advantages of having a lot of leaves at once is you can build a large "hot compost" pile; the ultimate in backyard composting experiences. A hot compost pile can go from raw material to finished compost in one month given ideal conditions. Some of the species of composting bacteria generate a tremendous amount of heat doing their work. If you can collect a "critical mass" of material at one time- a cubic yard or more- your pile will heat up to a surprising degree. A good hot compost pile can reach 140 degrees F at its center. After a week or two, these hot bacteria will have exhausted enough of the food supply to decline, allowing other, cooler, bacteria to thrive. Finally, your pile can be finished off by red worms, sow bugs and other critters that will eat organic matter not consumed by the bacteria. Red worms, often called compost worms, do not burrow in the soil; they evolved living in leaf litter. Worm castings (poop) is extremely rich in nutrients so you should welcome them. If red worms do not show up in your pile once it cools down, it makes sense to borrow a handful from a fellow gardener or even buy some from a garden supply store. Once you have them in your yard, they should populate any compost piles you build. If you do not build a hot pile, the worms and sow bugs will do their bit as you slowly add to your pile.

If you follow the right carbon to nitrogen ratio, keep your pile moist but not wet and turn it regularly, your composting operation will not generate foul odors or complaints from the neighbors. There are a host of compost bins and compost turning devices on the market that is worth researching and may make sense for you. But a simple pile turned with a garden fork will result in wonderful compost that will help your garden thrive.

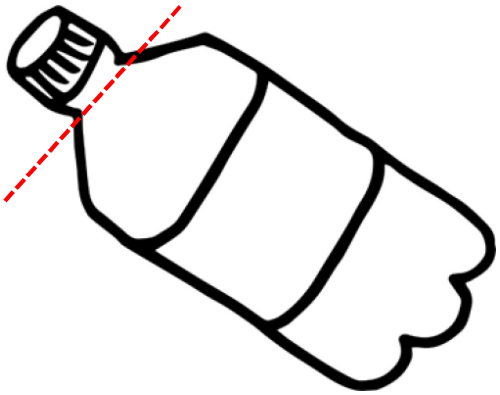
How to Make a Snail/Slug Trap

Erin McDermand, UCCE Master Gardener, Yolo County

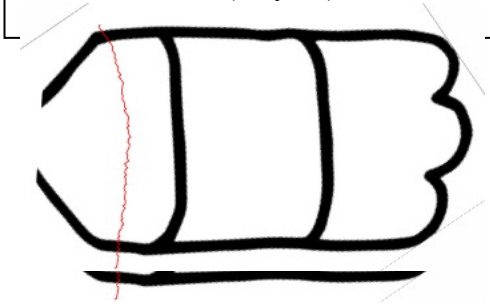
Although I have been using snail and slug traps like these for years, I really don't remember where the idea came from. The traps work well and have the added advantage of being pretty much dog-proof. Also, no mess from snail shells or used snail bait is on the ground. Because the bait doesn't come in contact with the ground and isn't exposed to pets, you can use the more effective metaldehyde-based products as well as the iron phosphate-based baits. The idea here is to bait the traps. Following are step by step instructions to make your trap.

You will need:

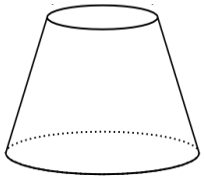
- Clear plastic water or well-rinsed soda bottle, 16 oz. to 1 liter.
- Box cutter, utility knife or sharp paring knife.
- Adhesive tape, any kind, small pieces.

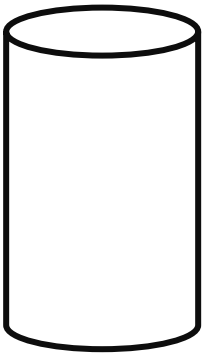


1. Cut cap and thread end off of bottle and discard (recycle).

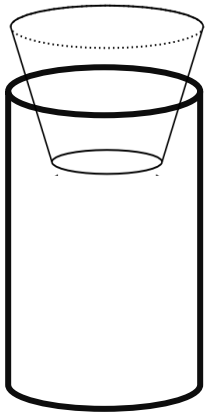


2. Lay bottle on hard surface; hold bottom part of bottle firmly and cut bottle all the way around at shoulder (red line). This leaves you with an open-ended cone and the bottle that resembles an open can.



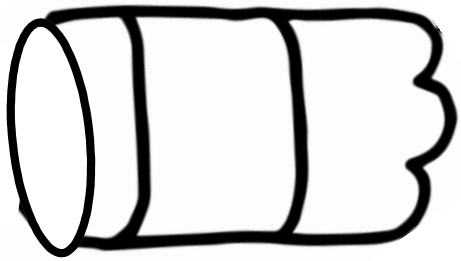


3. Invert the cone and put it in the open end of the bottle. Secure with a couple pieces of tape.



4. Put about a tablespoon of snail bait in the container. Turn container sideways, and shake gently to distribute bait.

5. Lay container with bait on its side near plants where slug and snail damage is evident.



Check the trap in a few days to see the results. Dispose of the entire thing when you think it has been used up and replace it. Since the bait is protected from rain and irrigation, it should last for a while.

You also can use rectangular-shaped juice bottles. They are a bit large and don't "hide" as well, but they do lie flat and work just fine.

Be sure to rinse the soda and juice bottles well to avoid attracting other pests.

Happy Hunting!

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Bare-root Adventures and Persimmon Love

David Studer, UCCE Master Gardener, Yolo County

First, let's talk a little bit about "bare-root" fruit trees. Nurseries in California sell these trees during the winter months without soil or pots--hence the name "bare-root". Often, they look like nothing more than sticks jutting out of a pile of wood chips. The wood chips are there to keep the roots moist. This is a less expensive way to acquire a fruit tree and they grow easily if given the proper care. Bare-root trees are field grown for one to three years then dug up and stored dormant without soil until they are sold. Many different types of deciduous fruit trees are sold this way--cherries, plums, pears, apples, peaches, apricots, and more, including the lovely persimmon tree.

Look for trees with a trunk between 1/2" and 5/8" in diameter. Once you've looked through the bin and chosen your preferred fruit tree "stick", take it home and plant it in your garden right away--don't let the roots dry out. If you can't plant it right away, keep the roots moist by covering them with damp woodchips, soil, or compost.

Dig a hole no deeper than the roots making sure that the sides of the hole are loosened to encourage the tree roots to grow into the native soil. Mound some soil in the bottom of the hole into a small hill and spread the roots evenly as possible around this hill so that the tree sits slightly up above ground level. This helps with drainage and allows for some settling. The bud union (where the tree has been grafted to its rootstock) should be about six inches above the soil and face towards the northeast (away from the sun). Fill the hole and water the roots in to ensure that they contact the soil and there are no big air pockets in the ground near the root ball.

Next comes the hard part. With a sharp pair of pruners, cut off all but about eighteen inches to two feet of the top of the tree trunk. I know, I know. I hate this part too but it will help produce a stronger tree that is easier to maintain and harvest. By fall it will look a lot better. Finally, protect the bark from the intense sun and any potential borer infestation by painting it with a solution of fifty percent interior latex paint and fifty percent water.

During the tree's dormancy next mid-winter, prune off all but about five main branches. Choose branches that grew at a 45° angle from the trunk. Then, take off one-third of the new growth on those branches. Always cut just above a bud--that small bump on the branch. Thinning the fruit, especially on young trees, will protect against branches breaking. Some sources recommend taking all of the fruit off before it matures for the first two or three years until the tree has grown a stable and sturdy structure.

For more information and lots of advice, search "bare root" on U. C. Agricultural and Natural Resources' website at https://ucanr.edu.

So now, let's talk persimmons. A lovely tree that one can plant in their yard for fruit and beautiful fall color. When harvesting, leave a few of the bright reddish-orange fruits for the birds dangling like ornaments from the bare branches.

Diospyros Kaki or the Oriental (or Japanese) persimmons are native to China where they have been cultivated for thousands of years. In Japan, one of the world's major producers of persimmons, they have been cultivated for more

than thirteen hundred years. The USDA introduced the Oriental persimmon into the United States between 1870 and 1920. At one time persimmons were grown commercially in the Gulf States but now the San Joaquin Valley produces most, if not all, of the persimmons grown commercially in the U. S.

Japan grows more than eight hundred varieties of persimmons with one hundred types considered important. However, local nurseries in California are most likely to sell just two varieties: 'Hachiya' and 'Fuyu'. These two varieties produce fruit without the benefit of pollination--called parthenocarpy, although the fuyu produces more and better fruit with a little help from the bees.

Hachiya has apiculate fruit (with a pointy bottom) and is astringent. The astringency comes from tannins in the fruit. Biting into a hachiya persimmon before it's ripe will really make you pucker. However, once slightly soft and ripe, this astringency diminishes and the fruit is sweet and edible. If you're in a hurry, you can cure the fruit by putting it in a closed container with some other fruit that emits ethylene gas like apples, bananas, or pears for a few days until it is ripe.

Fuyu has squarish-round, squatty fruits, no astringency, and no need for curing. They remain hard when ripe and they can be eaten like apples right off the tree. However, if you let them soften they become very sweet and custardy. Good with quality French vanilla ice cream, YUMMY!

Persimmons like a temperate climate but are tolerant of our summer heat if their trunks are protected from the sun. Some of the fruit may still suffer sunburn if exposed directly to sun but these are the ones you leave on the tree for the birds. Persimmons do not require a long cold dormancy so they do well in Yolo County's short winter. They are drought tolerant to a degree but need some water for fruit production.

Persimmons are prone to fluctuations in bearing. One year, you get a ton of fruit, and the next maybe only a few. A heavy crop will cause branches to break. So, just after the fruit set, thin the fruit so that it is spaced about 6" apart along the branch.

So, what do you do with all of those persimmons? As mentioned earlier if they are fuyus you can eat them raw like apples--but the hachiya is astringent until ripe or cured so be careful there. You can also dry them in a fruit dryer and have them as snacks all year round--taste like candy!

Here are links to a couple of other ideas that should stimulate the creative cooks out there to serve some exotic dishes this winter:

Disclaimer: There are no endorsements here, except to the persimmon. These links are just to get the reader to explore the possibilities.

Persimmon Cookies : Moist and sweet. Works with a variety of nuts, raisins, or Craisins!

Persimmon Risotto: Serve with pork tenderloin. This link actually has four interesting persimmon recipes.

Enjoy and Happy Gardening!

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Garden Myths

Jack Kenealy, UCCE Master Gardener, Yolo County

Someone once said "it's not what you don't know that will cause problems, rather it's what you do know that's wrong." Sad to say much of what I think I know about plants, gardening, and good gardening practice is actually wrong. I suspect this is true for most people who are told or taught something that sounds right, has always been done by someone they respect, and then they continue the practice without questioning whether there is any science supporting the practice.

Garden myths abound. Linda Chalker-Scott, Ph.D., Extension Horticulturist and Associate Professor at Puyallup Research and Extension Center, Washington State University operates a website devoted to "Horticultural Myths" (https://puyallup.wsu.edu/lcs/). She lists well over fifty common myths under headings as diverse as "Fertilizers," "How Plants Work," "Maintaining Trees and Shrubs," "Mulches," "Pesticides," "Planting Techniques," "Scientific Literacy," and "Soil Amendments." A perusal of just some of these interesting articles can be a humbling experience.

Lining the bottom of a pot with gravel before filling it with potting soil has been a standard practice of mine for some time. I thought this a great improvement over the pot shards my mother used to use. To my astonishment Chalker-Scott explains in her website article entitled "The Myth of Drainage Material in Container Plantings," that "(N)early 100 years ago, soil scientists demonstrated that water does not move easily from layers of finer textured materials to layers of more coarse-textured" and further that "one study found that more moisture was retained in the soil underlain by gravel than that underlain by sand." The irony of creating the situation I intended to avoid hardly bears mentioning.

Another common myth was addressed by Don Shor of Redwood Barn Nursery in his recent presentation to Master Gardeners. It is widely assumed that after pruning or removing a limb of any size that the wound should be painted or tarred over with some type of "healing" sealant. Chalker-Scott addresses this as well. "Wound dressings," she writes in "The Myth of Wound Dressings," "seal in moisture and decay, sometimes serve as a food source for pathogens, prevent wound wood from forming, inhibit compartmentalization, and eventually crack, exposing the tree to pathogens." Yet this myth persists.

Another myth in which I have misplaced my faith concerns "companion" plants. *Carrots Love Tomatoes: Secrets of Companion Planting for Successful Gardening,* (Louise Riotte, 1975, 1998, Storey Publishing, LLC), has long been among the very few books I keep in my greenhouse. This book has sold more than half a million copies and is still in print. Michael K. Bomford, in his 2004 Dissertation entitled, "Yield, Pest Density, and Tomato Flavor Effects of Companion Planting In Garden-Scale Studies Incorporating Tomato, Basil, and Brussels Sprout" submitted to the Davis College of Agriculture, Forestry and Consumer Sciences at West Virginia University takes Riotte to task on the quality of her science.

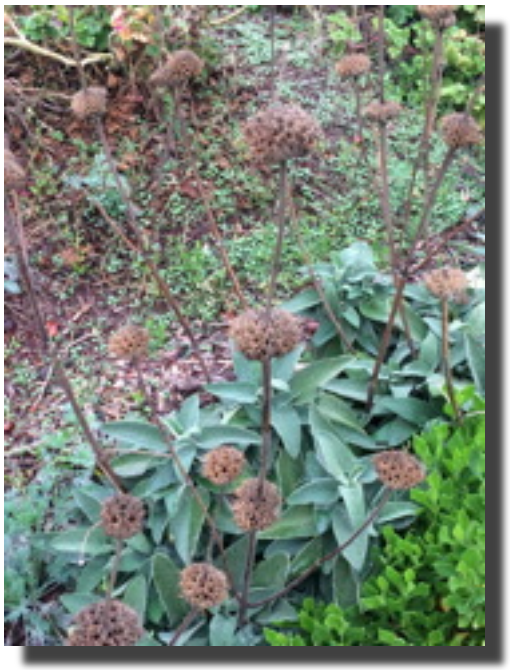
Bomford writes, quoting a Cornell extension service bulletin, "much of the popular literature that discusses companion planting is based upon some very bad science, in particular, the "sensitive crystallization method" originated in the 1930s by Ehrenfried Pfeiffer and often cited by Carrots Love Tomatoes author Riotte. Bomford's Table 1 is a list of the popular recommendations relating to companion combinations and while it is extensive, one example he provides serves to illustrate the problem with such associations very well. "Cabbage and tomato make 'bad companions' (Primal Seeds 2002, Bellamy 2003). Cabbage and tomato make 'good companions' (Garden Guides 2003)."

Both Bomford and Chalker-Scott note the vague meaning of "like," "loves," and the nature of the benefit. "Intercropping," "plant associations," and "polyculture," are terms more compatible with science. Lists describing traditional companion plants are, according to Chalker-Scott, "(l)ike horoscopes, these lists may be fun to use, but they should not be perceived or promoted as scientifically valid any more than astrology." Ouch.

This isn't to say the combination of corn, beans, and squash, the "three sisters" of yore is somehow invalidated as a beneficial instance of "companion planting." But science is a demanding and stern mistress. Studies such as those cited by Chalker-Scott and Bomford do show some associations may be beneficial for some plants in some situations but absent such science, companion planting guides have, "entertainment, not scientific, value" (Chalker-Scott).

Winter Garden Clean Up Tips

Michelle Haunold Lorenz, UCCE Master Gardener, Yolo County



As I write this, it is almost the winter solstice, which officially starts the winter season in the US. While it is not technically winter yet, it sure feels like it. With several weeks of pounding rain, followed by chilly mid-thirties temperatures, this is pretty much what winter looks like in our neck of the woods. We may get some freezing temperatures in the next month or so, and with the rain, winter winds, and an occasional sunny day, the garden will start to look pretty bleak.

Plants are brown and bedraggled, leaves are scattered on the ground, and a few blooming plants such as rosemary and lavender still bravely wave their scented flags to the few bees and hummingbirds poking around looking for nectar. Ugh! The temptation might be to just cut everything down to the ground and ignore the garden until spring, but there are other actions you can take that will help your garden stay healthy and beautiful during the bleak winter months.

I had a neighbor who used to complain because I had "so many dead plants" left standing in my garden. What looks dead to the untrained eye is actually a blessing to foraging critters. If you have perennials that have produced seed heads or pods, don't cut them back! Instead, leave them as forage for the wild birds and insects. These include yarrow, Jerusalem sage, amaranth, butterfly bush, Russian sage, and the many grasses that are so popular these days. Look at them with new eyes—those dried seed heads not only produce seeds for next year's growth and food for birds, they also provide structural beauty when not much else is going on in the garden. If you hold off pruning back soft perennials such as cannas and geraniums, you can help the plants over winter, especially if there is a hard freeze or two.

Leaves that drop from deciduous trees such as maple and oak are another form of debris that makes people crazy. Instead of trying to make your yard perfect, consider leaving them on your flowerbeds. These fallen leaves act as mulch to hold moisture in the soil, and they add organic material back into the soil when they decompose. A blanket of leaves keeps the soil warmer, allowing for continued root growth, and, in the event of a hard frost, could minimize potential damage to tender perennials.

Not all leaves are created equal however. Always rake up and dispose of fallen leaves from peaches, almonds, and nectarines. Do not put them in your compost. The fungus that causes peach leaf curl will overwinter in fallen leaves, and if left on the ground, the leaves will provide the perfect incubator for the fungus. The UC Integrated Pest Management System also recommends the following:

"To prevent peach leaf curl, use resistant peach and nectarine varieties where possible. For nonresistant varieties, treat trees with a fungicide every year after leaves have fallen. In cooler northern locations leaf fall usually is in late November. In warmer southern locations leaf fall can be as late as early January. Generally, a single early treatment when the tree is dormant is effective, although in areas of high rainfall or during a particularly wet winter, it might be advisable to apply a second spray late in the dormant season, preferably as flower buds begin to swell but before green leaf tips are first visible."

Fallen nectarine leaves

This is the perfect time of year for spreading mulch over vegetable gardens. Use about four to six inches of wood chips, dried leaves, straw, or other organic material. Mulch keeps weeds from sprouting when the winter rains come and allows organic matter to work its way into the soil. Come spring, your soil will be easier to work as you get ready for vegetable planting.

Taking time in your garden during the winter months can be a tremendous pleasure when there is not much else going on. Dried leaves can be a source of mulch, not just a nuisance. Look at the residual seed heads and dried pods as providing structure and beauty, as well as food for foraging birds. It will help you shift your perspective so the garden doesn't look so bleak as you wait for spring.

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Hybridizing Plants

Laura Cameron, UCCE Master Gardener, Yolo County

This is an article on Hybridizing plants. However, the term is sometimes confused with completely different processes, i.e., GMOs, and Cloning. Therefore a quick aside to note the differences involved in the each is warranted:

- A **GMO** is an organism produced by modifying its genome through genetic engineering technology done inside a lab**.** Highly complex technology, such as gene splicing, is used. These high-tech GM varieties can include genes from several species. GMO varieties can have genes transferred from one kingdom to another, such as bacteria to plants. For example, some GMO corn has genes from *Bacillus thuringiensis* spliced in to prevent corn worms from eating the crop.
- **Cloning** is a process used to produce offspring that are **genetically** identical. This is done by acquiring genetic material from a mother plant, usually through cuttings, to generate an exact duplicate of the stock plant using rooting hormone.
- **Hybridization:** involves producing an offspring through controlled sexual reproduction between two organisms by a breeder. Natural, low tech methods are used.

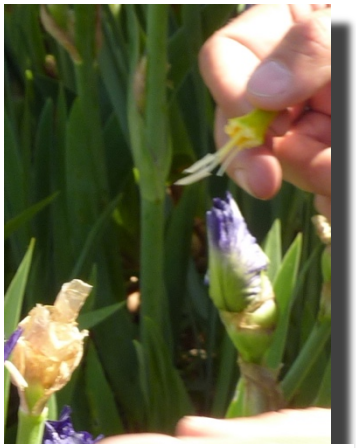
As defined in the C*alifornia Master Gardener Handbook* a hybrid is defined as the progeny of a cross between two individuals differing in one or more genes (characteristics). In horticulture, the cultivar resulting from a controlled or manipulated cross of two genetically diverse parents. An F1 hybrid is the first generation of offspring from a cross of two distinct parents.

Basically, taking the pretty color of one plant and combining it with the resilience of another to create a pretty, resilient plant creates a hybrid. Tracking a cross is written as Plant A x Plant B. Plant A is the "mother", the seed parent; and Plant B is the "father." The offspring, or hybrid, is the product of the seed produced in the mother plant and will contain attributes of both parents, yet is different from each. Sound familiar?

Open Pollination (OP) is just like it sounds (pollination by insects, birds, wind, or other natural means). These plants are often referenced as standard varieties or when the seeds have been saved across generations or across several decades, heirloom varieties. While heirlooms are usually open-pollinated, open-pollinated seeds are not always heirlooms as open-pollination is ongoing. Closed pollination can be both, self-pollination or artificial.

The seeds of open-pollinated plants will produce new generations of plants; because breeding is uncontrolled and the pollen source is a mystery, open pollination may result in plants that vary widely in genetic traits. Open pollination does increase biodiversity as well. A few examples of open-pollinated plants are heirloom tomatoes, beans, and peas.

Heirloom vegetable varieties are defined as having been in cultivation at least fifty years and are open pollinated. Heirloom varieties often lack resistance to common diseases affecting a particular crop while hybrids of the crop have been developed to have some degree of resistance.



Using an iris flower with the petals removed for pollination.

Many new vegetable and flower varieties are hybrid. These plants usually have more vigor, uniformity and better productivity than OP plants left to their own devices. While you can collect and reuse hybrid seeds your crop the next year will not mimic the first year's crop. They will revert back to the parent variety which will no longer represent the "best of both plants." Collect seeds from the best plants and eventually, you'll have your own new variety.

Developing a non-hybrid, open-pollinated (OP) variety using classic plant-breeding methods can take six to ten generations. Charles Darwin and Gregor Mendel devised a method of controlled crossing between 1856-1863. This allows plant breeders to produce seeds that combine the favored traits of two parent lines in the first generation. Seed companies will grow two parent lines in the field each year designate, the parents and under controlled conditions, pollinate. Then seed is harvested from the females.

Want to try your hand at hybridizing? There are methods that are complicated and those that are easy. Basically, you are manually transferring pollen from the stamen of one plant to the pistil of another. First, pick the plants with the qualities you want. Then at the right time transfer pollen from the male to the female. Do this a few times and with a few plants as you never know what's going to happen.

Brush Method – Using a small brush loosen the pollen from the deepest part of the flower and then rub the brush over the stigma of the plant to help pollination. Be gentle.

Petal Method – Remove the petals from a male flower and brush it against the stigma of female flowers.

There are a number of books and articles available on Hybridizing. Want to hybridize snapdragons, you can find an article, no problem. Want to create your own "Limequat"? Go for it! Remember, they have to be in the same botanical species. Save and sow your seeds. Let us know what you create.

A Garden for all Seasons

Jan Bower, UCCE Master Gardener, Yolo County

It is possible to have a spectacular garden all year round. The key lies in choosing the best trees, shrubs, perennials, bulbs, and annuals for your space and climate for each season. In autumn, that ideal was demonstrated for Yolo County in Central Park Gardens of Davis through a new docent-led tour program. Three Master-Gardener trained docents led eighteen visitors on a successful public tour that featured a variety of plants growing in the fall in its seven themed gardens—Rose and Flower, Sensory, California Native, Meadow, Beneficial Insect, Vegetable, and Waterwise. Similar tours are planned for winter, spring, and summer.

Linda Parsons, Master Gardener docent, leads fall garden tour in Central Park Gardens of Davis

Interesting phenomena

Leaves change colors and drop each autumn. What causes this to happen? The Christmas cactus only blooms once a year during the Christmas season. How does the plant know it is Christmas? Certain flowers, like poinsettias, bloom only during the winter. And in the spring, winter buds on the trees break open, and leaves start to grow. How do plants detect the time of year?

The variation in weather from day to day determines everything that happens to plants. Changes in temperature, day length, and precipitation waken plants from dormancy, set them flowering, and then cause them to die. Some plants have a main season of bloom, while others offer a second flush of flowers. Some plants grow in all seasons and form a framework for the more seasonal plants, while others, such as evergreens, bridge the lull between the different seasonal peaks of color and bloom.

Seasonal Changes

The different seasons depend upon an area's plant hardiness zone. The U. S. Department of Agriculture divides the United States into eleven climate zones, with Zone 1 being the coldest and Zone 11 being the warmest. Yolo County is in Zone 9 and has a long growing season, with hot summers as high as 106 degrees Fahrenheit. In the winter, plants must be able to withstand temperatures as low as 25 degrees Fahrenheit.

Although the vagaries of the weather may vary, and plants do not necessarily provide the convenience of flowering according to the calendar, here are some expectations for each season. Some of the plants mentioned can be found in Central Park Garden of Davis, but not all of them.

Winter—December, January, February

After the shortest day has past and the joy of Christmas is over, pruning roses becomes an important winter garden activity. Bright colored berries of the cotoneaster, holly, nandina, and pyracantha, and different colored barks and twigs, add interest to the gardens when flowers are scarce. Hedgerows shelter plants from the wind, stop plants from being buffeted and reduce the effects of wind-chill. Fresh vistas open up and evergreens and yuccas become more prominent with leaves off the trees, A few little growing plants can cheer us up, such as the earliest white snowdrops and colorful crocuses, cyclamens, and primroses.

Spring—March, April, May

Spring comes with ecstatic joy. It is generally the time when the earth awakens from its winter lethargy, and bulbs and plants begin to stir in the ground. According to the calendar, it all begins on March 20, when the sun's position is such that day and night are of approximately equal length. Temperatures climb, soils warm, and spring rains set growth in motion. An old saying says, "March winds and April showers bring forth May flowers." Daffodils are the primary early spring flower. Other spring-flowering bulbs are scillas, tulips, hyacinths, alliums, and bearded irises. Fruit trees, such as plum, cherry, apple, and almond, blossom, along with redbuds, magnolias, and crepe myrtles. There are shrub roses, pink peonies, apple-green flowering hellebores, forsythia bushes with yellow flowers, blue-flowered ceanothus and pulmonaria, and red-tipped photinia—all spectacular in the spring.

Summer—June, July, August

June 21 is known traditionally as the Summer Solstice and is the longest day of the year. This marks the beginning of summer and produces a wealth of color until temperatures rise to 105 degrees Fahrenheit in July through mid-August, and there is no rain. Then the garden becomes a real trial, and shade, an important asset. A southwest facing garden is usually the warmest. A north-facing garden gets the least hours of sunshine, so is generally more suitable for shade-loving plants. Sunflowers, lavenders, agapanthuses, lilies, fuchsias, salvias, hollyhocks, and geraniums bloom in the summer, along with ornamental grasses, such as fescues, eyelash and fountain grasses, and climbers, such as clematis, roses, and wisteria, and many more. Summer is flower's heyday!

Autumn—September, October, November

As the sun begins to sink lower in the sky and the night becomes chilly and darker, our senses tell us that the reign of summer has come to an end. The Autumn Equinox arrives on September 23, officially marking the beginning of fall. Autumn is one of the garden's most beautiful seasons with russet and gold ornamental grasses, bright purple asters, pink alstroemeria, yellow calendula, red sedum, and vivid colors of foliage on maples and other deciduous trees. Fruition is abundant for pomegranates, citrus fruits, pears, figs, and apples. Gardeners are kept busy with pruning, raking, mulching, and generally preparing the gardens for the colder winter months ahead, rain, and maybe even some frost.

Summary

Since no two growing seasons bring precisely the same results, the gardens must have a mixture of plants. Thanks to dauntless travelers and collectors, there is now a great influx and variety of flowers from all over the world in our gardens. The goal is to weld these plants into a harmonious whole that spreads through all the seasons, so there is always something of interest blooming in the gardens throughout the year.

Fall Gardening Tips

Peg Smith, UCCE Master Gardener, Yolo County

This is the time of year when we tend to become obsessive in a clean-up and tidying mode. Our urge to have everything tidy and pruned and raked needs to be tempered with an appreciation of nature's needs.

Fallen leaves can make a good mulch around trees and shrubs returning much-needed nutrients back to the soil with no effort on our part. If there are smaller perennials or annuals becoming swamped by leaf fall simply clear the leaves away around the crown of the plant to avoid fungal or bacterial disease development. These plants will also appreciate the mulch when the frosty nights arrive. If you have a lawn that at this time of the year is now covered with leaf fall use your mower with a mulching setting or mulching adaption and cut the leaves into pieces that will break down easily and provide a feed for the lawn when spring growth begins.

Lady beetles hibernating in fallen leaves

Fallen leaves also provide shelter for overwintering beneficial insects such as lady beetles. If lady beetles overwinter in your garden they and their larvae will be ready when the first eruption of aphids occurs. This is an effective way of encouraging lady beetles to populate your garden. Many of the bags of lady beetles we buy are from large overwintering collections in the foothills but the natural life cycle urge of these lady beetles is to 'go west young man' when they are released, even to the California coast. It is much more effective to encourage overwintering on site by leaving collections of leaves as good sheltered habitat for these helpful insects.

Keep your eye on the weather forecast! Use commercially available plant covers or old sheets or towels (not plastic) for frost tender plants if the frost will be prolonged. Many plants can tolerate an hour or two of freezing temperatures around 30'F and then recover but when the temperature holds well below freezing in the 20s'F for several hours overnight plants can be irreparably damaged. Succulents can become pure mush. http://ceyolo.ucdavis.edu/files/52971.pdf

Even though the daily temperatures are down from the summer heat the soil can still dry out without regular soakings of rain. Keep an eye on the garden for plants that need water as so far this year we have had limited rain. Plants can withstand a deep frost more easily if they have adequate water.

The dormant pruning season is here (http://ceyolo.ucdavis.edu/files/52981.pdf), and careful pruning of shrubs and trees can encourage healthy growth and stronger structure.

As the seed catalogues come in it is always a choice of "Should I buy fresh seed or will my leftover seed still have enough germination?" If the seed has been kept dry and in a cool place here is a conservative, approximate guide of when to discard old seed.

- DISCARD AFTER ONE YEAR
  Sweet corn, parsnips, spinach
- DISCARD AFTER TWO YEARS
  Bush and pole beans, beets, leeks and onions, parsley, peas, peppers, swiss chard
- DISCARD AFTER THREE YEARS

Broccoli, Brussel sprouts, cabbage, cauliflower, kohlrabi (these may be good from 3-5 years depending on the conditions in which they have been saved)

- DISCARD AFTER FOUR YEARS
  Radishes, Turnips

FLOWER SEED
Annuals are generally good for one to three years; perennials for two to four years.

Enjoy your catalogue cruising!

WINTER CLEANUP

- Continue to remove fallen leaves where absolutely necessary, such as pathways and driveways for safety. Also clean-up any spent annuals and finished vegetable plants.
- Add disease free plants and leaves to your compost pile.
- Clean garden pots and store for future use. Turn all unused pots on end to prevent water collection and breeding areas for pests and diseases. Treat pots with a dilute solution of bleach.
- Sharpen, clean and oil garden tools.
- Gas lawnmowers need a yearly tune-up and blade sharpening. There are many electric lawnmower models now available that have mulching attachments. Mulching your grass clippings as you mow keeps cuttings out of the green waste and provides nutrients directly back to the lawn.
- Properly dispose of any old or unneeded pesticides and herbicides. The Yolo County Landfill accepts household hazardous waste every Friday and Saturday from 7:30 AM – 3:30 PM.

WATER

- Adjust the irrigation systems or turn off once the rains provide good deep and regular soakings. Operate irrigation systems manually as needed if the soaking rains are few and far between.
- Check potted plants for moisture, too much water and inadequate drainage can lead to root rot.
- Make sure pots or plants sheltered from the rain by eaves get any supplemental watering needed.
- Consider collecting rainwater for watering plants during dry periods.

PROTECTION

- Protect frost sensitive plants including citrus with a frost cover.
- Adding a string of old holiday lights can provide additional heat. (Newer LED lights do not produce enough heat)
- Watering the soil will help the soil retain heat and can help the plant's roots and lower branches survive.
- Plastic sheeting is not recommended to protect plants because it cannot breath and traps moisture.

PLANTING

- December is the last month to plant spring blooming bulbs such as daffodil, tulip, anemone, and crocus.
- What to plant now: cool season annuals : Primroses, pansies, violas, snapdragons, calendulas and poppies.
  - cool season perennials: Cyclamen Hellebores, Daphne and Iberia.
  - herbs: cilantro, flat and curly parsley
  - bare-root fruits and vegetables: strawberries, berries, rhubarb, grapes, fruit trees, artichokes, asparagus, horseradish, onions, and garlic.
- Use row covers to protect seedlings on cold nights.
- Watch for slugs and snails. Iron phosphate is the recommended integrated pest management solution for slugs and snails.

- Extend your harvest time by planting cool season vegetables every two weeks in December, January and February. http://ceyolo.ucdavis.edu/files/53274.pdf
- Late winter is the best time to plant or transplant most perennial vegetables, shrubs, roses, or trees. They will have time to become established before the heat of summer.
- After you have discarded your summer vegetable plants, turn the soil over and add compost.
- Sow favorite vegetable seeds in trays early February for your summer garden.

FERTILIZER

- Apply a fertilizer to dormant roses to encourage bud break. Alfalfa pellets are an effective fertilizer for roses.

PRUNING

- Roses can be pruned in late December through early February.
- Dormant prune fruit trees and grape vines by the middle of February.
- Spray deciduous fruit trees and roses with dormant oil to smother pests, such as insect eggs, mites, and scale.

MULCH

- Very important to lay three to four inches of bark mulch in the garden to retain moisture and to prevent soil erosion from winter rains.

For further information on the above points refer to these websites: www.ucanr.edu/sites/YCMG and www2.ipm.ucanr.edu

UC MASTER GARDENERS - YOLO COUNTY PUBLIC WORKSHOP SCHEDULE

January & February 2019

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

JANUARY WORKSHOPS

DAVIS

Date	Time	Topic	Venue
Saturday, January 5	10:00 – 11:30 AM	Roses & Shrubs: Winter Care & Pruning	**CPG***
Saturday, January 19	11:00 - Noon	Fruit Tree & General Pruning	**CPG***
Saturday, January 26	10:00 – 11:00 AM	Flower Arranging	**Grace*****
Saturday, January 26	10:00 AM - Noon	Rose & Fruit Tree Pruning	**ACE********
Sunday, January 27	2:00 – 4:00 PM	A Year-Round Kitchen Garden	**Davis Library****

***CPG** (Central Park Gardens) on B Street between Third and Fourth Streets, Davis, CA 95616
****Mary L. Stephen, Davis Library**, Conference room, 315 E 14th Street, Davis 95616
***** **Grace Garden** 1620 Anderson Road, Davis, CA 95616. (At the back of the church parking lot.)
******ACE** 815 Third Street, Davis CA 95616

WOODLAND

Date	Time	Topic	Venue
Saturday, January 19	10:00 – 11:30 AM	Grape Pruning and Care	**WCC***

***WCC** Woodland Community College, Building 400, 2300 E. Gibson Road, Woodland, 95776.

ESPARTO

Date	Time	Topic	Venue
Saturday, January 12	10:30 – 11:30 AM	Fruit Tree Pruning	**Esparto***

***Esparto Regional Library,** 17065 Yolo Avenue, Esparto, CA95627

FEBRUARY WORKSHOPS

DAVIS

Date	Time	Topic	Venue
Saturday, February 16	10:00 – 11:30 AM	It's Planting Time: Hints for Successful Planting of Annuals and Perennials and Recommended Vegetable & Ornamental Plants for Yolo County	**CPG***
Saturday, February 23	10:30 AM – 12:30 PM	Everything You Want to Know About Vegetable Gardening	**Davis Library****

***CPG** (Central Park Gardens) on B Street between Third and Fourth Streets, Davis, CA 95616
****Mary L. Stephen, Davis Library**, Conference room, 315 E 14th Street, Davis 95616

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

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

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Send a Letter
to an Editor!

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Please put: *Yolo Gardener* in the subject line

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