THE YOLO GARDENER

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SLIDE Into a More Water Efficient Garden

Michael Kluk, UCCE Master Gardener, Yolo County

Water is a precious resource. This is becoming increasingly clear as we are deep into a wide-spread drought event. The seven western states have experienced much drier than average rainfall and much hotter than average temperatures for more than twenty years with only a few years of respite that did not relieve the overall impact. Currently, Lake Mead, the largest water storage facility in the country, and the source of water for over 20 million people, is at 35% of capacity, the lowest it has been since being built in 1935. A look at Folsom Lake and Lake Oroville in our more immediate neighborhood tells the same story. Climate scientists predict that dry periods will only increase in frequency and intensity as climate change progresses. In short, we must anticipate that drought conditions will be with us for the foreseeable future.

Folsom Lake – May, 2021

Approximately half of all residential water used in California goes to maintain landscapes. As gardeners, we should learn to use water responsibly and, as a bonus, save a little money on the water bill. That doesn't mean paving the yard or covering it with rock mulch. Creating yet another heat island doesn't make sense either. But there are several steps you can feasibly take to reduce your water use and still have beautiful ornamental plantings and even a vegetable garden and fruit trees.

Apply only as much water as your plants need.

There are two sides to the water use equation; learning how much water to apply to maintain various plants in your yard in reasonable health and learning how to best conserve the water that you do apply. The first of these can get a bit complicated but it is possible to bring it down to a level that most of us understand.

Continued on next page

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Many gardeners simply overwater. You can't manage what you haven't measured. So, the first step is to determine the amount of water you are applying to a given area of your yard. If you are using sprinklers, you may need to put out a flat pan or tray, run them for a known amount of time and measure the amount of water applied to a given area. If using a drip system, check the amount of water each dripper in the system puts out per hour, count the drippers and do the math. If you water by hand, run your hose at your chosen flow rate into a five 5-gallon bucket so see how long it take to fill it.

The water a particular plant needs is affected by the weather (temperature, humidity, and wind), the amount of shade it may receive during the day, the type of plant, the spacing and the ability of the soil to retain moisture. Our valley soils, generally high in clay, retain water very well. The traditional view looked to replace the water lost through evapotranspiration (ET), the evaporation from the soil and transpiration of water through the leaves. The standard was measured using turf or alfalfa, both water thirsty plants. New research, Simplified Landscape Irrigation Demand Estimation (SLIDE), has shown that most established perennial landscape plants can survive and look acceptable when receiving roughly half of the ET value. Desert adapted plants can be given one-third of the ET. Plants may not grow optimally or look perfect with reduced water, but they will survive and be generally attractive. That may be a small sacrifice during a deep drought year.

Let's unpack the basic calculation. (You can find the ET for your area of Yolo County each day at this site, in case you want to exercise your inner geek.) https://ucanr.edu/universal/CIMISUtilities/StationPicker.cfm?selectstation=0) But, in general, in the Central Valley, the ET during the heat of the summer is a quarter to a third of an inch of water per day. An inch of water applied to a square foot is approximately 2/3 gallon. So, the average ET in the summer is about a fifth of a gallon per square foot per day. Half of that is a tenth of a gallon per foot, or a gallon per 10 square feet per day. See below to learn why you do not want to apply water to an area on a daily basis however.

As a practical matter, many experienced gardeners provide less than half of the ET to established plants that are adapted to our Mediterranean climate with reasonably good results. However, you will need to watch your plants closely if you want to slide back the water even more than half of ET. On the other hand, many landscape plants will need more than half of the ET value to produce well or even to survive. For example, annual flowers need .8 x ET, lawns need .8 x ET, vegetables when blooming and fruit is sizing use 1 x ET, most fruit trees when blooming and fruit is sizing require 1x ET. But as a careful, water-wise vegetable gardener and backyard orchardist, you can grow successfully with less water than typically used by commercial agriculture.

You can find a discussion of the water needs of various plant types in this article, https://ucanr.edu/sites/UrbanHort/Water_Use_of_Turfgrass_and_Landscape_Plant_Materials/SLIDE__Simplified_Irrigation_Demand_Estimation/. The University of California Center for Landscape and Urban Horticulture has helped us out by putting a handy calculator on-line. https://ucanr.edu/sites/UrbanHort/Water_Use_of_Turfgrass_and_Landscape_Plant_Materials/Water_Demand_Calculators/Water_Demand_Calculators/index.cfm The calculator applies the SLIDE principles that look to minimize water use while maintaining basic plant health. Using it, you can plug in the basic variables such as your geographic area, plant type and time of year and get a recommended gallon amount per area. Playing around with the calculator will give you some valuable and surprising insights into how different plant types, perennials vs. annuals for instance, and plant spacing affects water needs.

Of course, this will give you only a rough estimate of the amount of water needed. The amount of shade a plant receives during the day, soil type, etc. are all factors. A dulling of leaf sheen or change in color from green to blue-green or gray are common signs of water stress. So, watching your plants to see how they are doing is important, recognizing that we may need to tolerate something less than optimal to save water. There are also a number of cultural steps you can take to reduce the water a plant will otherwise need.

Reducing Water Needs through Cultural Practices

Water deeply and less often rather than more often for shorter periods. This allows water to penetrate deeper, and so encourages deeper roots which are more resistant to drought. You should let the top two inches of soil dry before watering again, deeper for deep rooted plants. Lawns and bedding plants should be watered to at least 6 inches deep. Perennial shrubs and trees should be watered to one to three feet. Test with a probe or water meter. Most perennials and young trees will do well with watering once per week. That means that the one gallon per day per ten square feet application should be applied as seven gallons one time per week. Many established trees and drought tolerant shrubs can be watered very deeply one time per month.

Raised beds and drip irrigation retain water and allow for better control of water

Switching to drip irrigation, if you have not already, can save up to half the water you would apply with sprinklers or flood irrigation because if allows you to apply just the amount of water you want where it will do the most good, at the roots of the plants. When coupled with a modern irrigation timer, it also allows you to conveniently water at the most efficient time, early morning.

Use three to four inches of organic mulch such as straw or wood chips to prevent soil from drying and losing moisture to the air. Keep mulch away from trunks. Or use thick layers of newspapers in rows, covered lightly with mulch.

Incorporate composted organic matter into the soil, which will aid in water retention. Compost also adds nutrients to the soil and feeds beneficial soil microorganisms.

Fertilize less often and in reduced amounts, especially fertilizers high in nitrogen. Nitrogen stimulates growth, resulting in increased need for water. Organic fertilizers tend to supply nutrients more slowly as they break down so may be a better choice in drought conditions.

Avoid pruning when plants are water stressed thus unable to heal wounds quickly. Pruning may also stimulate growth resulting in more need for water.

Reduce weeds in your plantings since they compete with your desired plants for moisture. But try to limit hoeing and soil cultivation because this will cause deeper layers of soil to dry. Pulling or merely cutting weeds off at the surface is preferable.

Move container plants so that they get more shade, especially in the afternoon. Use glazed pottery or plastic pots when possible. Unglazed pottery dries out more quickly.

Lawns take a disproportionate amount of water to maintain. Now is a good time to think about limiting or eliminating your lawn. Drought tolerant perennials and some alternative groundcovers are much less thirsty. If you keep your lawn, leave the grass clippings to serve as a mulch. Mow the lawn at a height of 2-4 inches which will actually reduce its irrigation needs. If you choose to let your lawn go dormant by withholding some water, reseed bare spots with drought resistant varieties such as fine fescue.

The SLIDE calculator interestingly reveals that perennial plantings that cover 80% or more of the soil area actually require substantially less water than the same area where trees and shrubs are more isolated. (It is unclear whether heavy mulching between isolated perennials will yield a better result but it is likely that it will.)

Irrigation timing is critical, including on a daily and seasonal basis. Irrigating during the early morning from 2:00 a.m. to 6:00 a.m. is optimal. Modern irrigation timers make that quite feasible. This will allow water to soak into the soil before it evaporates but also allow the sun to dry wet leaves reducing the chance for fungal

diseases. Seasonally, the amount of water necessary to keep plants healthy in mid-summer is more than is necessary in spring and fall, so recalculate and adjust your irrigation accordingly.

The stage of plant development is also important to consider. Newly transplanted plants, even those that are "drought tolerant," will need more regular watering the first year than they will need thereafter. For many vegetables and fruit trees, water needs are highest during blossoming and fruit sizing. Once most of the crop is full sized and ripening, water can generally be reduced. That may not be a useful approach for many vegetables that will continue to set fruit throughout the growing season. But for tomatoes, that are less likely to set fruit once the temperature begins to cool, reducing water then will have little impact on production and can improve quality.

In the vegetable garden, emphasize the more drought tolerant options. Tomatoes require less water than cucumbers or peppers. Some varieties are more drought tolerant than others. 'Black Diamond' watermelon need less water than most others, 'Dark Star' zucchini is reported to be among the least thirsty. In general, grow only what you will use. Vegetables grown here in the winter, brassicas such as broccoli and cauliflower and lettuces can take advantage of winter rains, often needing little irrigation. Some water-wise fruits include pomegranates, figs, jujubes, Asian persimmons, olives, pineapple guava, loquat and prickly pear cactus.

Overall, reduce your watering levels and pay attention to how your landscape plants, garden and trees are doing. Be prepared to accept less than optimum growth and appearance. Plan to make some changes now or in the near future to develop a more drought resilient landscape. You may choose to not plant some area, such as some of your annual flowers or vegetables, letting the area lay fallow under a thick blanket of mulch. Be sure to maintain your trees and foundation plantings however since they will require a substantial amount of time to replace and the shade provided by a mature tree is invaluable. Each of us can make only a small contribution but it will add up.

References

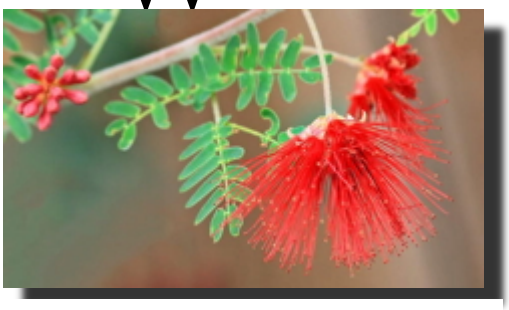
The UC Davis Arboretum website allows you to search for low water use plants that are recommended for our area. https://arboretum.ucdavis.edu/plant-database

The Sonoma Master Gardeners has published *Food Gardening with Less Water*. http://sonomamg.ucanr.edu/Food_Gardening_with_Less_Water/

Attracting Hummingbirds – Without a Feeder

Sue Fitz, UCCE Master Gardeners, Yolo County

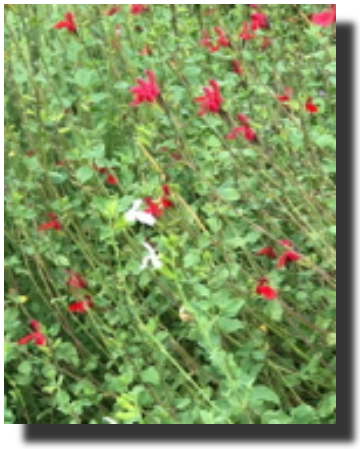
Want to encourage hummingbirds, but know you're too busy (or lazy) to keep a feeder stocked and clean? A carefully curated selection of plants can supply a year-round supply of nectar, in a fairly small area of ground, or even in a few large pots. I am in charge of several large flower gardens in both Davis and Woodland, so have ample opportunity to see which plants hummingbirds favor. I have found five plants that hummers especially go for, whose blooms span the whole year, so they never go without something to feed from in your yard.



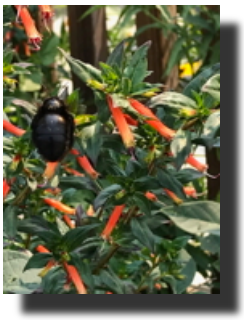
Calliandra californica

By far, the most popular plant is *Calliandra californica*, Baja Fairyduster, a twiggy evergreen shrub that reaches five by five feet. It The sugar content in the flowers is a few percent higher that the sugar

has a huge number of fluffy, red flowers from March to mid-December. The sugar content in the flowers is a few percent higher than the sugar water mix recommended for feeders. This makes this plant THE favorite of hummingbirds, resulting in regularly occurring arial battles with rivals above the plant. Honeybees also work the bush heavily. It's easy to grow if given good drainage and full sun.



The second most popular plant is *Salvia microphylla* 'Hot Lips', which produces scads of tiny red and bicolor flowers in the classic hooded and lipped shape of the Lamiaceae family. This plant is never out of bloom, and it's rare to walk by one without seeing a hummer feeding from it. It's another small, twiggy, evergreen bush that likes full sun and good drainage. It tends to top out at thirty inches high, but can spread four or five feet wide, unless cut back a couple of times during the year. I try to do this in late spring and late summer when there are other food sources available until it comes back into bloom a few weeks later. This plant is almost essential to grow, since it is hard to find plants that will flower in deep winter, when hummingbirds have few food sources. To maximize the production of winter blooms, it helps to plant it near a 'heat sink' like a south or west wall, or by an expanse of concrete, that will keep the plant warmer in winter, promoting bloom. This plant is also very popular with the large, black Carpenter bees.



The next favored plant is *Cuphea* 'Vermillionaire', a semi-tropical perennial that produces countless orange, tubular flowers on slender, wiry stems, from mid-March until late December. During the coldest part of the year, it drops it's leaves and dies back to the ground, then emerges rapidly at the advent of warmer weather to produce a two-foot high and wide bush. Again, it's another sun lover, and while drought tolerant, it generates far more flowers when given adequate water. This plant also is beloved by carpenter bees, which are quite noticeable, since they weigh so much the whole stem bobs wildly as they cling tightly, foraging for nectar. I have a row of these planted next to my 'catio', and my two kitties spend hours looking out the window, watching the hummers and bees buzzing around the plants.

Salvia 'Mystic Spires' (*Salvia farinacea x Salvia longispicata*) is another perennial that is heavily used by hummers. Actually, it's heavily used by just about every pollinator- birds, bees, butterflies and flower flies. While this article is on hummingbird favorites, if I had decided to write on pollinator favorites instead, this would have been the plant I would have led with. Good sized, deep green leaves cover eighteen-inch high by three-foot-wide plants, a lovely foil for the countless deep blue spikes of flowers that are continuously produced until heavy frost arrives, then kick back in again in March. If planted by a heat sink, it can flower all the way through winter, providing food during the lean time of the year. It needs full sun to bloom it's best, and while it will survive on a reduced water schedule, it will flower most heavily with adequate water.

If you're willing to put in a support for climbing, there's nothing that thrills a hummer more than a vigorously growing *Ipomoea coccinea*. This is an annual vine related to morning glories but is better behaved and produces much fewer volunteer seedlings. It has many common names; red morning glory seems to be the most used. The leaves look a bit like morning glories, but the flowers are narrow, screaming scarlet, slender trumpets, produced in incredible numbers all summer long. This needs sun and adequate water to bloom it's best. I have mine on a chain link fence, and on hog panels attached to a wood fence. If you can't figure out any other support, try pounding in a tree stake, wrapped in chicken wire or bird netting where you want the plant to grow,

and it will climb the pole and throw off streamers of flowering tendrils when it reaches the top. There is a close cousin, called cypress vine, that has ferny foliage and similar flowers, but it seems less happy in our dry, summer heat and is trickier to grow.

Finding these plants isn't too hard. The morning glory can be found online, it grows quickly from seed. The fairyduster is usually offered at California native nurseries, (it technically is not a native, but it's such a nice plant that it gets granted honorary membership, after all, Baja California is right next door). The other three are regularly offered by the larger plant nurseries in spring and early summer.

Well, if you can fit all these into your garden, you will have lots of color (heck, you'll probably be able to see it on google earth with all that red), and I guarantee you will have lots of happy, well-fed hummers. Add a birdbath, and you'll be all set, lots of bird action without having to mess with mixing up sugar syrup and unclogging ant-filled feeding ports. Happy birding!

The Amazing Manzanita

Tanya Kucak, UCCE Master Gardener, Yolo County

Most trees have thick bark. The bark insulates the living tissue from weather and protects it from insects. Have you ever wondered why manzanitas have bark so thin that it peels in midsummer? Kate Marianchild did, and she set out to find the answers to a multitude of questions about what makes manzanitas so special. Her zoom talk in January to the Santa Clara Valley chapter of the California Native Plant Society is archived at https://www.youtube.com/watch?v=RHj15yuVwuY as "The Amazing Manzanita and All Her Relations." Here are some highlights of her presentation.

Peeling bark. Manzanitas can perform stem photosynthesis in the trunks and branches, converting sunlight to sugar. (photo: Tanya Kucak)

Manzanita bark is wafer thin. When the bark peels away in midsummer, the trunk and branches are green underneath, containing chloroplasts. So manzanitas can take advantage of the long days of summer by photosynthesizing even more sugars through the exposed trunk and branches as well as through the leaves. The rest of the year, light can penetrate the thin layer of bark. The annual peeling, along with the smoothness of the bark, keeps lichens, moss, and fungi from attaching themselves to it. Bitter tannins in the bark also deter insects and are responsible for the red-brown color.

If you do see lichens and moss on a manzanita, Marianchild said, you will find dead wood underneath. Gray striping on the bark is dead wood that, she speculated, the plant sacrificed in extreme drought conditions. Since the bark resists fungal colonies, the roots rely on mycorrhizae -- fungi that help plant roots harvest water and nutrients from the soil -- more than most plants.

Leaves and flowers of manzanitas are also adapted to drought. The hard, leathery, wax-coated leaves keep their edges turned toward the sun, minimizing water loss from their surfaces. The flower buds form many months in advance so that when conditions are right, they can burst into bloom "on a dime."

Because manzanita flowers bloom during the winter rainy season, their downward-opening urn shape and waxy coating protects pollen from being washed away in a rainstorm. Queen bumblebees hibernate underground all winter and emerge from their sleep in synch with the bloom to collect pollen. To release the pollen, a bumblebee disconnects her flight muscles from her wings and begins to vibrate her flight muscles, causing an audible buzz or hum. When the buzz reaches middle C, the pollen is released onto her abdomen. The hairs on her abdomen are forked, enabling them to hold pollen. She eventually grooms the pollen onto structures on her back legs. Each time she moves to a new flower, some of the collected pollen is transferred to that flower. In this dance between bee and flower, each flower gets pollinated, and the bee gets enough protein-rich pollen to eat and to store in the cells where she lays her eggs.

(By the way, according to Danforth et al., in *The Solitary Bees*, buzz pollination "has evolved at least forty-five times independently in bees, and approximately 58% of bee species" can perform it. Notably, honeybees are among the species that cannot perform buzz pollination.)

Other insects also feed on the nectar that manzanitas provide during the winter, but some of these are what Marianchild called "beeloaders": nectar thieves who cut holes in the flower, taking nectar without providing pollination services. In addition, year-round Anna's hummingbirds as well as migrating hummingbirds rely on manzanita nectar, and more than fifty species of moths drink the nectar of common manzanita.

The flowers turn into small red manzanita berries, which are eaten mostly by birds but also by a surprising number of wildlife. "Arcto" in the genus name *Arctostaphylos* means "bear," and one of the groundcover manzanitas has the common name bearberry for good reason. Bears and coyotes are the most important seed dispersers, Marianchild said, and can carry manzanita seeds long distances. Scarification in an animal's digestive tract (as well as fire) aids germination. Raccoons, foxes, black-tailed deer, and small rodents also enjoy the berries.

Marianchild herself relied on manzanita berries for a couple days after a bear got her food while she was backpacking. She took a handful of berries, crushed them with her teeth, sucked the juice out, and spit out the pulp and seeds. Eating too many seeds, she cautioned, could lead to intestinal blockage. (Recipes for using the berries are in the book *Living Wild* by Alicia Funk and Karen Kaufman. Historically, manzanita berries have been steeped into a cider and ground into a sugar or sweet flour.)

To help this ecological story unfold in your garden, plant a manzanita! California has almost a hundred species and subspecies, and a wealth of garden-tolerant cultivars, all drought-tolerant. Here are the most commonly used species for gardens

- Common or Parry manzanita (*Arctostaphylos paryana*) is native to Yolo County and makes a good specimen shrub. It tolerates richer and heavier soils better than most manzanitas. The Dr. Hurd cultivar is a reliable large shrub, ten to twelve feet tall and wide, that can be pruned to show off the red-brown bark and be an eye-catching focal point.
- Howard McMinn manzanita (*Arctostaphylos densiflora*) is probably the most-planted variety in gardens and public places because it tolerates average garden conditions so well. It tolerates pruning and is easily kept at five to six feet high and wide, but it can eventually be eight feet high and fifteen feet wide.
- Sentinel manzanita (*Arctostaphylos densiflora* 'Sentinel') also tolerates average garden conditions, but is more upright, six to eight feet tall and four to ten feet wide.
- Bigberry manzanita (*Arctostaphylos glauca*) thrives in hot, summer-dry conditions in well-drained soils. It also is best grown as a specimen. It features blue-gray to white-gray foliage and the largest berries of any manzanita, about half an inch across.

Patio Invaders! Identifying and Controlling Ants

Ann Trump Daniel, UCCE Master Gardener, Yolo County

It all started in one corner--small volcano-shaped piles of the sand between the pavers in our patio. And as all armies do, they marched on across the paver patio until I knew I needed to learn something about these wee invaders and how to combat them.

While I am not sure of the of the type of ant that I had, I suspect that they might have been pavement ants (*Tetramorium caespitum*). If you are dealing with ants either outside in your garden, on your patio, or inside your home, please consult with the helpful resources of University of California Agriculture & Natural Resources (UCANR) Integrated Pest Management (IPM), particularly **Key to Identifying Common Household Ants**.

Pavement ants were likely introduced to the United States from Europe early in the 1800s. They are generally about 1/10 to 1/6 inch long and vary in color from dark brown to black. Most information about pavement ants has been gathered through observation. The reproductive ants or swarmers emerge in the spring when they mate and the queens burrow into the soil to begin laying eggs. The eggs develop over a 2–3-month period and then they emerge as worker ants. I suspect that what I observed on my patio pavers was this emergence of new worker ants. Most pavement ant colonies, which can contain over 10,000 workers, are found under sidewalks, building slabs, and large rocks. It is from these colonies that the ants can enter buildings by way of cracks in the foundation walls or slab. Watch out for sand piles or small soil particles near any cracks—the ants are depositing debris from the excavation of their nests.

While it is not reasonable to think that you can eliminate ants from outdoor areas, through careful observation and appropriate management you can protect your plants and keep ants from entering your home. The key is to discover the ants early by checking in late winter and spring, when it will be easier for you to manage the ants. Here is a list of UCANR IPM recommended management practices:

- Apply an effective, enclosed, insecticide bait to poison ant colonies. Both sweet baits such as boric acid (low concentrations with less than 1% active ingredient) and protein baits (products containing fipronil or hydramethylnon) are attractive to pavement ants. Place in protected areas inaccessible to children and pets.
- Apply sticky material (e.g., Tanglefoot) or other effective barriers to bark, encircling trunks to exclude ants. But don't apply Tanglefoot directly to the bark. Instead use a paper barrier.
- Keep irrigation water, leaf litter and mulch, and vegetation at several inches back from foundations and walls of buildings where ants are not desired inside.
- Manage the aphids, mealybugs, psyllids, scales, whiteflies, or other insects secreting the honeydew on which ants are feeding. If ripening fruit is the source of ant attraction, pick, prune, or knock that from plants and if unwanted dispose of it.

- Prune shrubs and trees back away from structures to eliminate bridges to buildings.
- Remove any plants too near to structures if they consistently host ants or honeydew producers and if ants coming indoors has been a problem.

While I did not encounter any significant damage, my observation of these ants has certainly made me more mindful of checking my foundation and "policing" the patio to make sure that I pick up debris, prevent any drips from the faucet or water hose, and keep foliage away from the foundation.

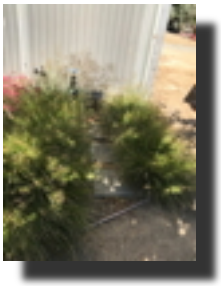
There are steps we can all take to prevent serious issues with ants in our homes and gardens. For more details regarding insecticide bait and sticky barriers, please go to **Ant Management in Gardens and Landscapes** on the IPM website. You will also find useful information about pavement ants and other ant types on the IPM site.

Ground Cover Trial: Part Two

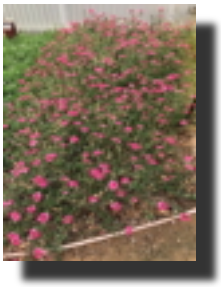
Sue Fitz and Paula Haley, UCCE Master Gardeners, Yolo County

The vast majority of ground covers offered in California nurseries have been selected for the milder climate areas along the coast, where the bulk of the state's population resides. This is the second of a three-part article on a ground cover trial planted by UCCE Master Gardeners-Yolo Co. at Woodland Community College in 2017, which was installed to observe multiple ground cover choices, to see if they will succeed in our hot, low humidity climate.

After planting up the thirteen plots with the selected groundcovers, they were plumbed with drip irrigation, using elevated micro-sprayers. To encourage the plants to fill in as quickly as possible, they were watered twice a week at first, gradually increasing the interval between watering, as the plants filled in. It was decided not to mulch, since many of the chosen plants needed contact with the bare ground, in order to spread. Weeds were hand removed while it was possible to tip-toe between the plants without stepping on them, but once they started to grow together, Preen®, a pre-emergent herbicide was used twice a year. Eventually, after three years, most of the groundcovers knit together sufficiently to exclude weeds, although there are still a few that haven't been able to accomplish this to this day. The more aggressive growers, after filling in, needed almost monthly trimming to keep them in bounds during warm weather, while a few have not yet filled in their plots at all. After four years, the results are in.

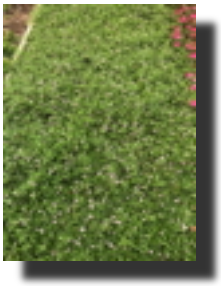


1. *Carex pansa*, or California meadow sedge was started from a single gallon plant, torn into small pieces, and spaced a foot apart. This sedge is a clumper, and it took about three years to fill in. Weeds were successfully repressed after the clumps grew together. About that time, it started flowering, with graceful wands of small green 'flowers' waving in the breeze. The leaves are about a foot tall, and the flower stems add another six inches to the height of the plant. The planting looks attractive all year. The only problem that developed was a propensity to reseed wherever there is nearby bare ground. This might be an advantage if one is trying to fill in a large area, or a negative thing if an unmulched flower bed is nearby.



2. *Verbena peruviana*, or Peruvian verbena was widely planted throughout the area in the ninety's and the 'oughts'. Then it suddenly became unpopular and disappeared. It forms a low mat of ferny foliage over the ground, with either red or pink clusters of flowers

(depending on the variety) spring through fall. While pretty, and popular with pollinators, it does have the shortcoming of not being dense enough to completely suppress weeds. Since it is too brittle to walk on, this means placing steppingstones in it to provide a spot to step into the area to weed, or the need to use a pre-emergent herbicide a couple of times a year. If it is shorted on water too severely, it can get spider mites, and the leaves can brown unattractively, although it recovers quickly.



3. *Phyla nodiflora*, or Lippia is a California native groundcover that seems to relish our hot climate. It spreads quickly by stolons to form an attractive, low green mat, covered by pink flowers during warm weather, and is beloved by bees. It tolerates occasional foot traffic but cannot take frequent passage. If given generous watering, it can be hard to keep in bounds, infiltrating into areas where it may not be wanted. With restricted water, it is much better behaved. It filled in within eighteen months in its plot, and completely choked out weeds.

4. *Origanum marjorana* 'Betty Rollins', which was thought to be an automatic winner, turned out to be a dud. At Woodland Senior High School, on a high-quality clay soil and watered with city water, it fills in a sunny area with a thick low carpet of small round leaves, and has pink flowers, eagerly sought after by bees, all summer long. The fragrant foliage can stand occasional foot traffic. Unfortunately, the poor soil and water quality at Woodland Community College has left the plants stunted, weak and unable to fill in their allotted space, even after five years. This is disappointing, but surely just a result of poor environmental conditions.

5. *Muehlenbeckia axillaris*, commonly called wire vine. This Australian native produces a spreading mat of wiry stems clothed in tiny, rounded leaves that are glossy green. It quickly filled in its space in less than eighteen months, dense enough to totally suppress any weeds. This plant has received many admiring comments on its looks. The only concern is the slow build-up of its height. Under the surface layer of stems and leaves is a building mat of leafless stems, now about eight inches in height. It will be cut back close to the ground this spring, to see if new growth will result, or whether it is one of those plants that will not regenerate from old, leafless stems. It also likes to climb over or up any obstacle it encounters, which might be a problem if planted in a confined space. The jury is still out on this one.

6. *Corethrogyne filaginifolia* 'Silver Carpet' was another unexpected failure. In Woodland High School's California native garden, this plant forms a large, unbroken mat of silvery foliage, covered with lavender daisies in late summer. Placed in Woodland Community College's xeriscape garden, which is basically a mound of decomposed granite, the plant grew so vigorously it was removed to keep it from swamping nearby succulents. So, it was a great disappointment to see it stall out, turn chlorotic, and wither in the groundcover plot. Since the water quality was the same in both the xeriscape garden and the groundcover garden, it's clear that the sticky, saline clay soil was the problem. It was finally removed and replaced by-

7. *Teucrium chamadrys* commonly known as wall germander. A small, one-foot sub-shrub of upright stems covered with shiny dark green leaves, it spreads by stem layering, slowly increasing in diameter. In summer, it is topped by soft magenta flowers, a major bee draw. This planting is relatively new, but is doing well, and just starting to spread

and fill in. Other observed stands of this plant show good weed suppression, once the ground is totally covered.

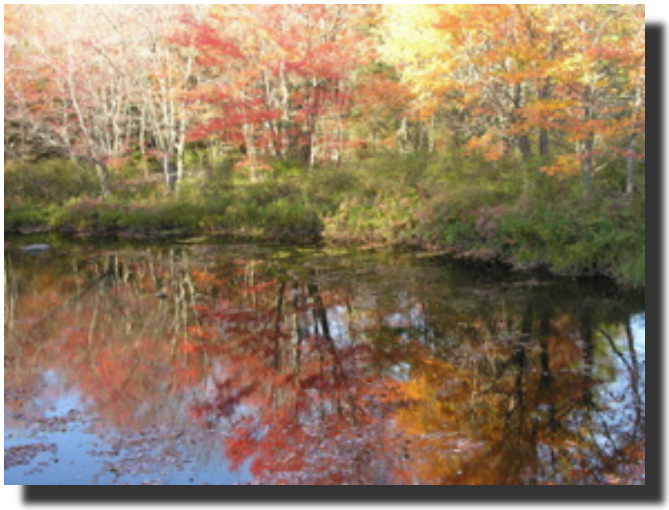
8. *Dymondia margaretae* 'Silver Carpet' is a south African native that produces a very low carpet of brittle silvery leaves, that has yellow daisy flowers in early summer. It spreads steadily via fat stolons, forming an unbroken, uniform mat. It is too brittle to walk on, usually steppingstones are used if a pathway through it is necessary. It does an excellent job of choking out weeds. This plant also attracts much attention, it is very beautiful.

This is about half-way through the list of ground covers that were trialed, so this seems a good spot to stop for now, before eyes start to glaze over. Part three of this series, appearing in the Winter issue of the *Yolo Gardener*, will finish the individual ground cover evaluations, make some recommendations, based on what has been observed, and offer tips on installing and caring for groundcovers while they are getting established.

Falling Leaves

Jan Bower, UCCE Master Gardener, Yolo County

Fall is upon us. It is my favorite time of the year. The nights get shorter. The air cools with a hint of forthcoming rain, and maybe even ice and snow. And the leaves turn spectacular shades of red, yellow, and orange. It's a time of hustle-bustle to do all the chores that have been put off during the summer---weatherstripping on the doors, a gutter leak in the courtyard, and an accumulation of junk for the landfill.



But wait—this is Autumn—the perfect time to get outside for fun---travel, hiking, biking, camping, photography, and gardening. It's a time for bright pumpkins placed on porches, meditation, and nostalgic memories. I get melancholy just thinking about beautiful falling leaves. They offer a calming effect as I reflect back on my favorite spots in the Upper Peninsula of Michigan, Wisconsin, Minnesota, and the province of Nova Scotia—all places where I enjoyed rainbow-colored deciduous forests in the fall. But there is also beauty in the trees and leaves of Northern California, Oregon, and Washington. In these areas peak leaf color and drop are in late October.

So, why do leaves fall off trees every year?

I think trees don't want to waste all the good things in their leaves. So, to prepare for winter, the trees take back their nutrients from the leaves into their stems and branches. When the leaves are empty, the trees stop holding onto them, and they fall to the ground and are recycled or blown away in gusts of wind. In other words, the leaves fall off trees when they are not doing their job anymore in response to the changes in the seasons.

What is a leaf's job?

It's an interesting process called photosynthesis. Leaves take in energy from the sun, capture carbon dioxide from the air, suck up water from the soil through tubes in their trunks and branches, and make food for the trees. As the days shorten into longer nights, there is less sun. Cold sneaks its way into the daylight hours. The leaves stop working, and they die. While the trees are leafless, they can't make food. So, they hibernate, like bears, until spring, when the rains come, and they can make new leaves and food again.

Why do leaves turn color?

When leaves stop working, they stop making chlorophyll, which is the pigment that makes leaves green. As the chlorophyll production degrades, other pigments hidden in the leaves become visible—yellow, orange, red, purple, and their variants. The intensity of the colors, particularly red, is influenced by the amount of available sunlight. At this point, the trees also grow a layer of cells between the leaf stems and branches. This abscission layer stops the transport of nutrients and water to the leaves and protects the trees from winter cold and dryness. It is the main physical reason trees lose their leaves.

Do all trees lose their leaves?

No, some trees hold onto their leaves all year long. These trees are called evergreens because they stay "ever green" until they get old and damaged. Thick waxes and resins protect these leaves from freezing and fracturing. There are also some oak, beech, and ironwood trees that display foliage marcescens, holding onto their dry brown leaves until spring when new leaves form. Tree researchers believe they keep their leaves to protect next year's buds from browsing deer and the drying winds of winter.

How do I dispose of falling leaves in an environmentally responsible way?

Leaving the leaves on your lawn is not a good idea. As leaves get wet, they form a barrier that promotes growth of molds and fungi. Falling leaves should be raked, shredded to improve air movement, and added to compost bins. If the leaves are left on the lawn or garden, a mulching mower can be used to break them into quarter-inch pieces. These will decay and add beneficial organic matter to the soil. Also check with the city for on-street yard material collections, which occur on certain days in the months of October-December or place dead leaves in the weekly organic cart for pick-up. For craft enthusiasts, leaves make delightful fall-themed wreaths and centerpieces.

Last Call for Grace Garden

Cid Barcellos, UCCE Master Gardener, Yolo County

Grace Garden is ready to create a new volunteer team to lead this amazing garden project that helps feed the hungry of our community. Cid Barcellos and Gwen Oliver, UCCE Master Gardeners, Yolo County, started Grace Garden in 2009. Now we are ready to share what we have learned, how we have completed projects, what worked and what didn't. During this period of transition, we hope to step aside as others step up to assume team leadership. We are ready to step back and just be gardeners.

We are looking for a team of two or three people to help guide the many volunteers (mostly UCD students). Our fruit trees and vegetable beds are organic and have produced thousands of pounds. What do we do with our produce? We help feed the hungry of our community. We have donated to Davis Community Meals, to Yolo Food Bank, to Davis Meals on Wheels at the Davis Senior Center, and to other groups. In 2019 we harvested more than 2700 pounds of produce! We also offer free gardening classes to the public. None of this would have happened without the hard work of our many volunteers including UCD students, UCCE Master Gardeners, and community volunteers.

Come out and visit us. Volunteer hours are Monday, Thursday, and Saturday 8:00 a.m. - 10:00 a.m. during the summer and 9:00 a.m. – 11:00 a.m. during the rest of the year. Volunteers are always welcome to come out, to work, and to learn.

The end date for the formation of a new team is October 1, 2021. If no one steps forward by that date Grace Garden will cease to operate.

Master Gardener Help Desk

Joy Sakai, UCCE Master Gardener, Yolo County

Over the past month, almost every question asked by the public has some sort of link to the extreme heat and drought we experienced this summer. Whether it was yellowing leaves and fruit on the sun exposed side of citrus trees, damage to fruits and vegetables, lower than usual production, or an unusually heavy burden of insect pests, the heat has brought problems to Yolo County gardens.

Where severe heat is an issue, we counsel deep watering of trees every week to two weeks. Watering needs increase during the summer, and they dramatically increase during periods of extreme heat. Remember that in a drought, it pays to care for fruit and landscape trees above all. Trees are the most valuable part of any landscape, whether providing fruit and nuts, or shade and habitat. We recommend that clients avoid fertilizing during the hottest summer months since new growth is especially sensitive to heat damage and adds to water needs. Our volunteers recommend shading plants from direct afternoon sun if there are signs of heat stress, and mulch to reduce water loss and to limit heat damage to leaves, fruit, and roots. Where pests are concerned, our Master Gardeners follow advice from the University of California Integrated Pest Management website.

Speaking of pests, our most unusual question in the past two months came from a client who dropped an insect off at the UC cooperative extension office for identification. The client was concerned it might be a termite. One of the farm advisors identified this tiny flying insect as a webspinner (*Embiidina*) and asked us to further investigate.

Webspinners originated in Asia, but have been found on nearly every continent, including the Americas. They prefer moist, temperate Southern climates, so we just weren't sure what we had, since they are often confused with winged termites. We used the magnifier tool on a smart phone to get a good close-up photo, measured the length of the sample insect (0.25 in) and compared photos of termites with the sample we had. The thorax on our sample was relatively longer and thinner than a termite thorax and we found reports of these critters in Southern California and in Tracy, California. Our conclusion? This was a webspinner, which is not categorized as a pest.

We encourage gardeners in Yolo County to call or email your gardening questions to the UCCE Master Gardener Help Desk. Visit us (http://yolomg.ucanr.edu/YMGHelp/) and you can "ask a master gardener."

Fall Garden Tips 2021

Peg Smith, UCCE Master Gardener, Yolo County

In Fall a gardener's mind turns to bulbs and we tend to plant the traditional bulbs that originate in colder climates. Perhaps this year is the time to try something a little different, well suited to Yolo County's climate yet equally beautiful. Here are some suggestions to add to the garden for year-round gardeners' delight of something hidden below the surface and looked for in its season as it bursts through with color and beauty.

Spring Blooming

- Early spring:

  - Here's a very resilient candidate for your garden, Summer Snowflake *Leucojum aestivum* 'Gravetye Giant'
  - The *Iris douglasiana*, California native iris, are spring blooming, come in many colors and are summer dormant. They naturalize well.
  - Add in some *Narcissus* 'tete-a-tete'L. dwarf daffodil, and some Spanish squill (bluebells) *Hyacinthoides hispanicus* R. and you will have a fine spring show.

- Late Spring Blooming
  - For late spring blooms you can't go wrong with the reliable Allium family, ornamental onions. *Allium giganteum,* very showy with tall purple flowers. *Allium sphaerocephalum,* drumstick, attractive when in bloom and also when the flower heads dry. *Allium christophii* Star of Persia, its bloom is like a living firework burst. Alliums are pollinator attractors.

Fall Blooming

- The sea squill, *Drimia maritima* produces tall white spears in August/September. Its leaf season is winter and is most ideally grown in an area of ground cover or near grasses that will need winter cut back as its large leaves can smother other plants. It is summer dormant so place it where you won't disturb the bulbs during the summer. Best grown in companion with plants that are dormant in winter.

- Something more diminutive but spectacular in its own way for August/September bloom is the Argentine rain lily *Zephyranthes candida* that forms clumps of shiny, grassy leaves good edging plant or groundcover, attracts beneficial insects.

- For bright splashes of color in the Fall Aztec lily *Sprekelia formossissima* and spider lily *Lycoris radiata,* both red, and autumn crocus *Sternbergia lutea* is yellow.

Normally with Yolo County's mild winters Fall is truly the prime time to head into the garden to review and reinvigorate. Any perennial planted in the fall will go quietly about the business of producing healthy root growth throughout the fall and winter. By the spring and summer these plants have well established root systems and are better able to support a burst of spring growth and the following summer heat. Some of the more tender perennials planted in the fall may need a little frost protection on the coldest of our winter nights but most will come through with flying colors. You haven't missed the boat if you don't plant in the fall, spring will come, but do consider a detailed fall check of your planting needs.

Another way of adding to your garden palette of plants is to check with neighbors and friends to see if they are dividing any perennials that you may have noticed in a garden.

Many of our beneficial insect friends like a somewhat messy garden that gives them shelter over the winter. Lady Beetles over winter under loose leaf layers so you can allow some of the fall leaf drop to remain as winter shelter for our beneficial lady beetles. It is actually the lady beetle nymph, emerging in the spring, that consumes many of the spring arriving aphids. The nymphs are perhaps 'odd' looking but they are of great benefit to the garden.

A carpet of leaves from trees such as sycamore, or oak need to be cleared if they fall densely on the crown of a plant. This blanket of leaves on the crown of a plant combined with heavy winter rains can encourage crown rot.

Fruit tree hygiene is important to control soil and waterborne fungal and bacterial disease. Clean up all old fallen fruit this will reduce the possibility of fungal spores over wintering under the fruit trees to re-infect the spring fruit. Light pruning of dead or crossing branches will help trees weather the fall and winter storms. Follow the IPM recommended dormant spray applications or fruits and berries.
http://ipm.ucanr.edu/PMG/GARDEN/CONTROLS/dormant.html

The year-round vegetable garden is one of the benefits of our Yolo climate. We don't need to shut down vegetable growing for the winter. If you love the brassica family, cabbage, broccoli, cauliflower etc. now is the time to plant for a winter crop. If you are growing your own brassicas from seed many of the brassica seedlings are almost indistinguishable from each other so 'label, label, label'. Our Vegetable Planting Guide is a great guide to what and when to plant in any season. http://ceyolo.ucdavis.edu/ files/53274.pdf

If you are not growing winter vegetables, plant cover crops such as fava beans, clover or vetch to replenish the soil nitrogen for better spring yields. Cover crops also reduce the loss of the top soil in heavy winter rain storms.

Now is the time to scatter seeds for California annuals such as poppies and tidy tips. Rake back any mulch from the dirt, scratch the soil surface to loosen, scatter the seed and lightly rake the area to cover the seed. Water gently so the fine seed is not washed away. Enjoy the show in the spring.

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 planting peas and sweet peas 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 or place on a windowsill to 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. See: http://homeorchard.ucanr.edu/calendars/

- 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 complete fertilizer (one that contains nitrogen, phosphorus, and potassium). Fertilize in late fall with a slow-release complete fertilizer. 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 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 dead leaves.
- Divide and transplant bulbs, tubers, and corms.
- If your oriental poppies, iris, agapanthus, and daylilies are becoming less vigorous, 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 that will encourage shoot growth that will be nipped by the first frost. 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, 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.
- Fall is the best time to introduce perennials to your garden.
- Consider planting winter vegetables such as broccoli, lettuce, endive, parsley, garlic, and onion sets. http://ceyolo.ucdavis.edu/files/53274.pdf
- Take cuttings of your favorite annuals.
- Gradually move frost sensitive potted 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://ceyolo.ucdavis.edu/files/53031.pdf Problem Trees for Yolo County http://ucanr.edu/sites/YCMG/files/181041.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*), gingko (*Gingko 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*). You will need to have plenty of room if you are planting the oaks.
- 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*), 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 for a colorful selection of fall decorations, including pumpkins, gourds, dried corn, and fall flowers.
- 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. Grape vines wrapped around a circular form make an ideal basis for a seasonal wreath. 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.

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

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

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The Yolo Gardener – Fall, 2021

Send a Letter to an Editor!

email: mgyolo@ucdavis.edu

Please put: *Yolo Gardener* in the subject line

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