



THE YOLO GARDENER

Summer 2020

A QUARTERLY PUBLICATION BY THE UCCE, MASTER GARDENERS OF YOLO COUNTY

Master Gardener Program Resilience

Jim Fowler, UCCE Master Gardener, Yolo County

As with most California state agencies the UCCE Master Gardener Program has had to modify its operations greatly because of Covid-19. Essentially the University has allowed no face-to-face contact with the public since mid-March. This rule has eliminated, at least temporarily, Master Gardener information tables at farmers’ markets, as well as group presentations at public libraries, demonstration gardens, and other venues. These restrictions will continue for the foreseeable future. Master Gardeners, however, are a resilient bunch. They continue to find safe and acceptable ways to pursue the programs mission to provide university approved, science-based information to the gardeners of Yolo County.

For example, the Master Gardeners of Yolo County maintain a partnership with Woodland Community College to support a demonstration garden on the College’s campus. The way the costs of the partnership are paid is through an annual Spring plant sale. This year, because of Covid -19, the sale could not be held. Instead, Yolo County’s Master Gardeners devised a method to distribute the plants for free. They set up an online ordering system, gathered the plants to fulfill the orders, and had individuals drive into the UCCE parking lot where the orders were loaded into vehicles by volunteers.

Another partnership between the Master Gardeners of Yolo Co. and the Davis United Methodist Church followed Woodland’s example. This garden provides hundreds of pounds of fresh vegetables and fruits each year to Davis Community Meals. It also provides public education classes and trains community members as well as USD students in the basics of vegetable gardening. Support for this garden is also achieved through annual plant sales. But because of this garden’s special needs Yolo’s Master Gardeners decided that the garden could not afford to give away plants and opted to devise a plan to sell them instead. Adopting Woodland’s plan, the garden sold more plants this year than in any previous year.

A third partnership, among Master Gardeners, the City of Davis, and the UCD Arboretum, is located in at Central Park in downtown Davis. It is the main venue for public educational programs about urban gardening in the city. Those programs have also been suspended temporarily. This garden, that in the past has been maintained exclusively by volunteers, is one of the crown jewels of Davis. It is so important that, considering the city’s

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investment and because of public safety, the city has declared that maintenance of this garden is an essential service. But it has also placed strict guidelines on how and who can participate as volunteers. There can be no more than two gardeners at any one time, they must maintain a six-foot distance and wear masks, they must bring their own tools, and they must wear vests with signs requiring people to maintain a six-foot distance.

Despite the limitations imposed by Covid-19 UCCE Master Gardeners of Yolo County are still managing to transmit valuable gardening information through the use of technology. As many other organizations have done Master Gardeners have adopted Zoom technology to provide interactive classes on vegetable gardening as well as other topics. They are provided weekly. To find out when programs are to be offered go to “UCCE Master Gardeners of Yolo County” on Facebook. Like the page and turn on notifications so that you will be informed of when the site is updated. Zoom was also used to complete the training of this year’s Master Gardener class.

The UCCE Master Gardener Program of Yolo County has a webpage <http://yolomg.ucanr.edu/> that contains a large amount of valuable information on gardening as well as dozens of handouts describing how to solve different gardening issues. It also provides access to all former issues of this publication, the *Yolo Gardener*. Each issue contains a wealth of information.

Finally, while the UCCE office in Woodland remains closed to the general public, the Master Gardener help line is still very active. You can still call to leave a question via voicemail at (530) 666-8737 or send your question via email to mgyolo@ucdavis.edu. A UCCE Master Gardener, Yolo County, working from home, will answer your question. 

Irrigating Smart in Your Vegetable Garden

Michael Kluk, UCCE Master Gardener, Yolo County

The Sacramento Valley is technically a desert. Virtually all of the plants we grow in our home vegetable gardens will not survive without irrigation. On the other hand, water is a precious resource. If you are hooked into a domestic water system, it is also expensive. So, learning to irrigate your vegetables in the best manner makes a lot of sense. Unfortunately, with a variety of crops all growing at the same time in your garden, it is not always simple to put the right amount of water on at various stages in the plant’s life cycle and accommodate changes in the weather. It is, however, quite possible to grow a healthy garden in a water-wise way if you pay attention to a few basic guidelines.

Plants need water for photosynthesis and for transporting nutrients and other substances. Sufficient water is the primary factor determining production. Without it, growth slows down and production of fruits such as tomatoes or squash or seeds such as beans is limited or stops. But too much water can leave the soil with inadequate air and plants suffer.

How Much is Enough?

The amount of water a plant needs and the timing are influenced by a number of things, among them the type of plant, where the plant is in the growth process, temperature, wind, soil cover and the size and number of plants in a garden bed.

Seeds must be kept constantly moist in order to germinate and sprout successfully. Young plants do not need as much water as mature larger plant but must be watered more frequently until they establish a root system.



A transplant needs frequent water until it is established because the roots have been inevitably disturbed in the planting process and were probably constricted by the small pot it was in. Seedlings and transplants may need water daily or at least every other day, depending on the weather. Ideally, water should penetrate to the depth of the root system and a little below to lead roots down. Regularly stick your finger in the soil at least two to three inches below the surface to judge if it feels sufficiently moist.

Once vegetables have become established, watering frequency can be reduced to two to three times per week, but the total amount of water will need to be increased to accommodate a larger plant. A very general rule of thumb for vegetables is to apply an inch of water per week during moderate temperatures in the mid-eighties. If you are growing cool weather vegetables in the winter, you may only need to water during extended dry spells once the plants are established.

You will generally see irrigation recommendations expressed in inches rather than gallons, so let's take a minute to show you how to convert. A cubic foot of water is approximately 7.5 gallons. If you have a 4 foot by 8-foot bed, that is 32 square feet. Divide 32 by 12 to get the number of cubic feet it takes to cover that area with one inch of water; 2.67 cubic feet. Multiply that by 7.5 and we come up with approximately 20 gallons. Using these two formulas, you can calculate the number of gallons for any bed.



Typical water meter

Two other factors you may want to take into consideration are the rate and depth water will penetrate your soil and the root depth of the crop you are watering. Most of our soils have a relatively high clay content. Water penetrates clay soils more slowly and, because clay absorbs a lot of water, a given amount will not penetrate as deeply as in sandy soil. After you put an inch of water on, wait eighteen to twenty-four hours and check how far it penetrated. You can do this by digging a hole or using a water meter with a sufficiently long probe. Couple that information with the root depth of the various vegetables growing in your garden. For example, corn, potatoes and radishes have most of their roots within the top six to twelve inches. Beans, beets, carrots, cucumbers, peppers and squash have most of their roots within the top eighteen inches. Tomatoes, watermelon, okra and cantaloupe extend roots twenty-four inches or more. (See the chart at the end of this article. However, the chart applies to 'ideal' soil. It does not take into account soil type or soil obstructions such as hard pan or clay pan.) Ideally, water should penetrate to the depth of the lower roots. If it does not, you may need to put on more at one time. That would not necessarily mean more water total, but less frequent and heavier watering.

In hot weather, you will need to increase the amount of water applied. For example, if the maximum daytime temperature is one hundred and the nighttime low is sixty, one commonly used formula would suggest increasing the amount of water applied to two inches per week.

The actual amount you should give your vegetables during a hot spell is affected by several factors. If your beds are mulched, you may not need to increase your watering by as much. If you have liberal amounts of compost in your soil, which holds water very well, you may also not need to increase as much. A good measure is to pay attention to how your plants are doing. It is normal for the leaves of some plants, squash in particular, to go limp on a particularly hot afternoon. If they are perked up the next morning, they are fine. On the other hand, if your tomatoes and peppers look wilted, you need to water. You can supplement this information by using a water meter, striving to keep the reading six inches down in the moderately moist range.

How to Water

The method you choose to deliver water to your plants will have a big impact on how much water you will need to use and how well your vegetables will respond to the water you provide. Regardless of how you choose to water, water at night or in the early morning to minimize evaporation. We do not recommend overhead

sprinklers, flood or furrow irrigation. The former is inefficient and wetting the leaves of some vegetables regularly can spread disease. The latter are simply inefficient. As gardeners, we can do better.

If you have a small garden and like to spend time there, hand watering is an option. Direct water at the base of the plant, avoid spraying the foliage. It is hard to estimate the amount of water you are delivering when hand watering. Decide on a convenient flow rate and see how long it takes to fill up a bucket of known volume. You can then apply the intended amount, using the guidelines above.

Watering with a drip system is the preferred method. The initial set-up will require an investment of some time and money, but the ease, convenience, efficiency and water savings are a big plus. A drip system will deliver the amount of water you choose right to the plant slowly so that all of it can be absorbed by the soil with no run-off. A drip system also allows you to calculate most accurately the amount of water you are delivering to a bed. Simply count the number of drippers serving it and multiply by the flow rate.

There are a myriad of types and styles of drip system components available. In the scope of this article, it is only possible to hit a few of the most important points. Plan your system carefully. You can run a drip system off of a convenient hose bib or from existing risers that may have previously serviced a lawn. Each approach will use different components. There are different diameters of delivery tubing available. Connectors for the various sizes are not interchangeable so decide on one and plan to stick with it.



Typical Irrigation layout



Strip tubing with spray heads

For vegetable gardens, tubing with emitters already imbedded is simple and functional. Emitters that are one foot apart in the line work well although in particularly heavy soils, eighteen-inch spacing is also good. In any case, be sure to purchase emitters that are “pressure compensated” so that water distribution rates will be the same at the beginning and the end of a particular line. Various emitter flow rates are available. One-half gallon per hour and one gallon per hour emitters both seem to work well with our soils. You will notice that the surface of the soil remains dry except for a small circle at each emitter. But below the surface, the water spreads out through capillary action.

If you plant your vegetable garden in established beds, which we recommend, you should put together multi-line sets to cover the bed such as the one pictured. A set of three or four lines will give even coverage over a four-foot wide bed. It is often convenient to install a connector so that these can be removed or changed and a valve that allows you to turn a bed off when it is fallow. This will also allow you to give extra water to some beds by turning the others off when you run the system.

Because the soil surface remains dry, a drip system may not deliver water to newly planted seeds. You may need to water them by hand until they germinate and establish a root system or construct a watering tube with spray heads as pictured. Having a connector at each bed allows you to switch out the spray tube and install a regular drip line set once the seedlings are established.

Water is a limited and expensive resource. Each of us is responsible for utilizing our portion as responsibly and carefully as possible. Following the suggestions in this article will allow you to use water efficiently so that there will be enough for gardens now and into the future.





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VEGETABLE ROOT DEPTH – TO GAUGE WATERING DEPTH
Sources: UC Small Farm Program; NCCE Agriculture;
AZ Master Gardener; Stephen Albert, garden writer and teacher, Sonoma, CA
Compiled by Master Gardener Florence Nishida, September 2011

Depth: S = 18" - 24" (36"); M = 36" - 48"; D = >48"

Artichoke	D	48"+, perennial
Arugula	S	12-18"
Asparagus	D	6-8", perennial
Beans	M	24-36" wide spreading
Beets	M	18-36"
Bok choy	S	12-36"
Broccoli	S	18-36"
Brussels sprouts	S	18-36"
Cabbage	S	12"
Carrots	M	18-24"
Cauliflower	S	18-36"
Celery	S	18-36", biennial/annual
Chard	M	36-48", biennial/annual
Chiles	M	18-48", annual/perennial in tropics
Collards	S	18-24", biennial
Corn	S	18-36",
Cucumber	M	36-48"
Eggplant	M	36-48", annual/perennial in hot regions
Fava bean	M	36-48"
Fennel	S	12-18", perennial/summer annual
Garlic	S	12-18"
Jerusalem artichoke (sunchoke)	S	12-18", perennial
Kale	S	12-18", biennial/annual
Kohlrabi	S	12-18", biennial/annual
Leek	S	18-36", biennial/annual
Lettuce	S	18"
Mache	S	3-6"
Mustard greens	S	18" perennial/annual
Napa cabbage	S	18-36" annual
New Zealand spinach	S	10-24" biennial/annual
Onion	S	8-12"
Parsnip	D	48" biennial/annual
Peas	M	36-48"
Peppers	M	36-48"
Potato	S	18-24" perennial/annual
Radish	S	5-8"
Rhubarb	D	36-48+", perennial
Rutabaga	M	24-36" biennial/annual
Spinach	S	12-18"
Squash, summer	M	12-18+"
Squash, winter	D	12-24+"
Strawberry	S	12-18" perennial
Tomato	D	18-48" perennial
Turnip	M	18-24" biennial/annual

4800 E. Cesar E. Chavez Avenue, Los Angeles, CA 90022

Tel: (323) 260-2267 • Fax: (323) 260-5208 • <http://celosangeles.ucdavis.edu>

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Are ‘Murder Hornets’ the New ‘Killer Bees’?

Jack Kenealy, UCCE Master Gardener, Yolo County

Recent news stories of “Murder Hornets” have piqued interest and fears not seen since news hit more than forty years ago of the “Killer Bees” invasion of America from the South. By now we know fear of Africanized Bees was overstated, that internet searches of the subject lead to YouTube videos of old ‘Saturday Night Live’ skits and not to lists of casualties. It is right now being determined whether fears of the Asian Giant Hornet (*Vespa mandarinia*) of the order Hymenoptera, will prove as groundless as those of the “Killer” bees.



Physically the giant hornets look like something out of a B-Movie. The head has an almost cartoonish quality; a demented happy face on a two-inch-long yellow and black striped body with a stinger a quarter of an inch long. They can sting many times and the sting itself has been described by researchers as the sensation of having a “hot nail driven into one’s flesh”.

(<https://www.smithsonianmag.com/smart-news/giant-hornets-proliferated-during-chinas-heatwave-and-now-have-killed-28-people-210316/>).

“The Asian giant hornet’s life cycle begins in April, when queens emerge from hibernation, feed on plant sap and fruit, and look for an underground den to build their nests.” (<http://news.cahnr.wsu.edu/article/wsu-scientists-enlist-citizens-in-hunt-for-giant-bee-killing-hornet/>). While not aggressive towards humans, they will defend both their own nest as well as the colonies of honeybees they are occupying.

There have been a handful of confirmed sightings of the Asian Giant Hornet in North America, all in the Pacific Northwest. According to a fact sheet prepared by the Washington State University Extension, (<https://s3.wp.wsu.edu/uploads/sites/2091/2020/04/AGHPreReview4Factsheet.pdf>) the hornet is well adapted to conditions of the Puget Sound which are similar to its native temperate and tropical mountains and forests of Eastern Asia. Several of the recent sightings involve the hornets’ attacks on colonies of honeybees, their primary food source. Washington State has initiated an aggressive campaign to locate and eradicate hornet colonies and have established web sites for the purpose of having the public report sightings. A dead hornet was identified as recently as May 27, 2020.

Honeybee colonies, again according to the WSU fact sheet, provide a “rich, plentiful, and easily attainable food source.” While the Asian Giant Hornet (AGH) also preys on other hornets and wasps, its impact on honeybee colonies is a huge concern. To acquire the rich protein and fat of honeybee broods the AGH will attack a bee colony in three phases; hunting, slaughter, and occupation. Hornet scouts locate and mark a honeybee colony with pheromone which recruits additional hornets for the slaughter. As few as thirty hornets can massacre as many as 50,000 adult worker bees in a matter of hours. Typically, they will decapitate the bees with their mandibles and once they have occupied the colony they will chew the bee larvae into a paste and transport it back to their hive to feed to their own brood. The distance between the two colonies may be as far as a mile and a half.

Unlike Asian honeybees, which co-evolved with the AGH and developed effective defenses against the hornet, European honeybees which constitute the American honeybee industry, have no defense. The Asian bee can recognize the marking pheromone; they then swarm individual hornets, creating a ball of bees, each flapping its wings with incredible speed to create the heat and carbon dioxide necessary to kill the hornet.



The Asian Giant Hornet is a threat to honeybees

An article published online by SmithsonianMag.com on May 5 of this year takes the position the presence of the hornet is not a big deal. Floyd Shockley, the entomology collections manager at the Smithsonian National Museum of Natural History is quoted as saying “(Y)ou shouldn’t worry about it...More people die of honey-bee stings in the U.S. than die annually, globally, from these hornets.” He cites statistics to the effect that about sixty to eighty people die in the U.S. from allergic reactions to honeybee stings while only about forty people die in a year from giant hornet stings. Shockley downplays any notion the hornets pose any real threat to people or to honeybees.

In an interview for this article, Dr. Timothy Lawrence, Associate Professor at Washington State University and the WSU Island County Extension Director, stated that there is no evidence that the hornet has managed to establish itself in the northwest even though a couple of nests have managed to survive. A reproductive female has also been discovered although its unknown whether she had been inseminated.

It’s a judgment call as to how many nests must be determined to exist before it can be concluded the species has established itself. Meanwhile the hope is to capture live specimens, attach tracking devices to them and in this way locate and destroy the active nests. Dr. Lawrence also stated that models suggest the range of the Asian Giant Hornet may extend, if it manages to survive, into the northern valley as far south as Sonoma and down the coasts. Evidently the inland valley is not conducive to the pest.

UC Davis Professor Lynn Kimsey advised the hornets are unlikely to take root in California outside the coastal area as the state is too dry. “It’s humidity not temperature,” she stated. She also advised she had been stung by a very close cousin to the Asian Giant Hornet. “It hurts like Hell”, she enthused, but would rather be stung by a hornet than by a honeybee. The hornets sting is over quickly while the bee sting lingers a long time. She laughed at the “hot nail” comparison and suggested the source had spent too much time with Justin Schmidt’s Pain Index.

According to Wikipedia, “(T)he Schmidt sting pain index is a pain scale rating the relative pain caused by different hymenopteran stings. It is mainly the work of Justin O. Schmidt, an entomologist at the Carl Hayden Bee Research Center in Arizona”. https://en.m.wikipedia.org/wiki/Schmidt_sting_pain_index. Schmidt, who claims to have experienced the sting of every stinging ant, bee or wasp, puts the honeybee on the second of four levels, along with most of the order, while the Asian Giant Hornet is at the highest level four.

Kimsey is of the belief the hornet came to the State of Washington aboard a cargo container. She noted the Port of Oakland, one of the California coast’s smaller ports, unloads over a million containers each year. Seattle of course, unloads a much higher number. Overwintering queens can easily survive the few weeks it takes to cross the Pacific from Asia, and once awake in its new surroundings, migrate to an acceptable habitat.

Asked to comment generally on the Asian Giant Hornet, Professor Kimsey said “people need to take a deep breath and calm down.” But the concerns over the hornet are very real in Washington. Honeybees are necessary to pollenate crops grown in the northwest including blueberries, cherries and apples. The fear is that if allowed to establish themselves, the hornets will discourage beekeepers from locating their hives in areas where the hornets exist. Hopefully the current “search and destroy” effort to eradicate the pest before it becomes established will prove successful, and on some future date, the “Murder Hornet” will take its place next to the “Killer Bee” as another over hyped source of hysteria.



Grace Garden Update – June, 2020

Cid Barcellos, UCCE Master Gardener, Yolo County

Grace Garden, one of the outstanding UCCE Master Gardener partnerships in Yolo County started in 2009. Gwen Oliver and I, both UCCE Master Gardeners, Yolo County, decided to start a garden in June of 2009, just a small garden with a few vegetables. No big deal! In our minds we dreamed of beds with lots of vegetables that we could then give away to help feed the hungry.



Gwen and a part of the vegetable harvest.

The Davis United Methodist Church was willing to partner with us in developing this project by letting us use the area in back of the church. But the area behind the church is about 5/8 acre and was covered with Bermuda grass and other weeds. Gwen and I thought we could do better than that and set out to work. After a year of hard work and careful planning, in 2010 we built four 50' beds and four raised beds. We struggled to clear a plot and planted lots of vegetables (tomatoes, peppers, squash, etc.) resulting in a very nice harvest. We also used the young garden as a Master Gardener platform from which to teach others

about gardening

Encouraged by these results, in 2011 we added four more 50' beds and two more raised beds as well as drip irrigation for the whole garden. In January 2012 we planted ten fruit trees including apricot, plums, pluots, nectarines and peaches. Later we added pomegranates. And in 2017 we added ten more beds to the back corner of the church lot. The harvest from the garden has increased dramatically over the years from 946 pounds in 2011, to 1656 pounds in 2013 to 2731.25 in 2019.



Fruit Harvest



A UCD student helps to propagate

We have accomplished these tremendous results with wonderful volunteers from UCD, from the UCCE Master Gardener, Yolo County program, from the Davis United Methodist Church and from the community. We wouldn't have been able to do so much without the help of these volunteers. There isn't anything they aren't willing to do from planting seeds for the annual plant sale, planting vegetables and flowers after the plant sale, turning compost, spreading bark chips, weeding, and supporting smaller projects. During this quarantine time many of the students are no longer coming out. We miss them. We have built a bond with our student volunteers and enjoyed getting to know them and sharing our knowledge of gardening. We've become friends.

We are looking for more volunteers to come help us. The COVID 19 has put a big dent in our volunteer numbers. We encourage you to join us. Grace Garden is a great place to come in order, to enjoy nature, to talk about the plants, and to learn about gardening. We can keep our distance from each other and still accomplish so much. We also provide sterilized tools and clean gloves.

It feels good to know that those who can't buy fresh vegetables still have a chance to get them from Grace Garden. Last year the garden donated its produce to STEAC and Davis Community Meals. We believe that fresh vegetables and fruits are so much better than canned. STEAC and Davis Community Meals greatly appreciate the garden's contributions.

If you're interested in joining the effort, breathing fresh air, learning new things, and making a difference to the community in which you live, please contact Cid Barcellos at cidbarcellos@sbcglobal.net or Gwen Oliver at olivia999@comcast.net. for garden work schedules or for more information

Master Gardeners have a lot of information to share!



A Pelargonium by Any Other Name is Still a Pelargonium

Michell Haunold Lorenz, UCCE Master Gardener, Yolo County

Roses, daffodils, lilacs, lavender: all these flowering plants are known to gardeners and novices worldwide, but Pelargoniums? These gorgeous flowering plants are known worldwide as well but under the common name geranium. But guess what? These are not actual geraniums! True geraniums are quite different plants. True geraniums are in the genus *Geranium* and the family *Geraniaceae*.

Pelargoniums, commonly known as geraniums are also in the same family, but the genus is *Pelargonium*. They are evergreen flowering bushes, shrubs, or low-growing perennials in areas of low or little frost. Originally found in South Africa, these herbaceous flowers were once the darlings of the gardening world, but over time have fallen out of favor due to their ubiquitous presence in commercial and industrial gardens. Often reviled now as flowers that your grandma grew, they used to be a staple of the classic cottage garden. There are plenty of reasons to revisit these plants and why you should consider making pelargoniums the backbone of your summer cottage garden.



Pelargonium capitatum

Extremely hardy and easy to grow, the plants come in a variety of flower colors, leaf shapes, and scents. Notoriously unfussy, you don't have to worry about soil type, sun exposure, or insect activity with these workhorses of the summer garden. Plant them where you have a spot and they will fill in and start blooming quickly. Probably one of the best flowering plants for a beginning gardener, if you forget to water, prune, or fertilize Pelargoniums, they don't mind. Did you plant it in too much sun, or not enough sun? No matter! They adjust quickly and effortlessly to their surroundings and make the best of what they have to work with! You will always be a successful gardener when you work with these plants!

In the summer heat when much of the garden color has faded, these plants will carry on blooming away, providing color and scent in the dog days of summer. You can count on blooms from late February through November in areas with little or no frost. Some varieties produce showy flowers on long stems, making them ideal cut flowers for bouquets. Others have intensely fragrant leaves that when brushed up against or crushed fill the air with the scent of roses, peppermint, lemon, nutmeg, chocolate, or coconut. These scented varieties also have flowers, but much smaller and less showy, so the shape, color, and scent of the leaves take center stage, making them either a perfect showpiece or backbone of the garden.

Flower clusters can radiate upwards in umbrella-shaped umbels or protrude out on single stems. Colors range from pale pinks and whites to deep purples, hot pinks, reds, corals, and oranges. Leaves can be gently rounded palm-shaped, ivy-shaped, or deeply lobed, hairy or smooth, thick and waxy or soft and fragile. The choice of flower color and leaf-shape are almost endless!



Pelargonium tomentosum

One of my favorites is the peppermint-scented pelargonium, *Pelargonium tomentosum*, or commonly known as Peppermint Geranium. The leaves are dark green and fuzzy, with deep purple veining in the older leaves that provides a striking contrast. The small pale purple flowers grow on single stalks poking out of intensely fragrant peppermint-scented leaf clusters. Another favorite of mine is the rose-scented geranium. Featuring small pale green deeply lobed rose-scented leaves and pale pink flowers, this plant can spread up to three feet wide and two feet high. Cut it back hard at the end of the year and it will come back stronger than ever.

Another wonderful feature of these plants is the ease of propagation. Simply put the cut stems in a vase of water and over a month or so, they will start to sprout roots. You can then plant your favorites throughout your garden or share them with a friend. They also self-root if a stem touches the ground, so if you don't feel like rooting them in water, just bury a stem or two next to the original plant, or in a pot filled with quality potting soil and they will self-root; you will have a whole new batch of plants effortlessly.

If you are one of those gardeners that ignored this wonderful species, give yourself a chance to explore the many wonderful gifts it has to offer our Mediterranean gardens. Whether it is for the long-bloom time, color, or scent, there is something here for every garden.



Sustainable Land Practices for Climate Change: Part 2

Deborah Sorrill, UCCE Master Gardener, Yolo County

Editor's Note: This is the second part of a three-part series on climate change.

Part one of this series dealt with land management practices for global and national agricultural. It encompassed a discussion of “regenerative agriculture” as it applies to commercial use of land. This part, however, approaches horticulture at the local and national level. To see the similarities in solutions, regenerative agriculture now becomes “regenerative gardening”. Regenerative Agriculture refers to soil regeneration and carbon sequestration. Regenerative gardening sometimes refers to soil fertility, but its central tenant is wildlife regeneration.

Bees and Monarchs aren't the only animals facing the threat of extinction; wildlife, in general, is facing a precipitous rate of decline. Without supporting resilient food webs, we face extinction ourselves. Loss of wildlife habitat is as existential a threat to us as greenhouse gases. In the 1970s, the Pulitzer prize winning author and Harvard Sociobiology professor, E.O. Wilson, began discussing the fragile balance between ecological energy system (food webs) and human activity. At a time when extinction rates were not an issue, he noted: "If human beings disappeared tomorrow, the world would go on with little change. But if invertebrates were to disappear, I doubt that the Human species could last for more than a few months." It is as existential a threat as greenhouse

gases. Yet the rate of extinctions continue for example in cities US cities are losing 36 million trees a year, since 1970 in every ecosystem 2.9 billion breeding adult birds have been lost, and forty percent of the world’s insects are threatened with extinction within decades.

Among the biggest threats to wildlife are habitat loss, climate change and pollution. While climate change is a growing threat, the main drivers of biodiversity decline continue to be loss of natural habitat to farming for food, fuel and timber, and the overexploitation of plants and animals by humans through logging, hunting and fishing. There are forty million acres of lawn, not counting walkways, streets or building plots. There are 849 million acres in agricultural land. Currently, less than 4% of habitat is available to wildlife.

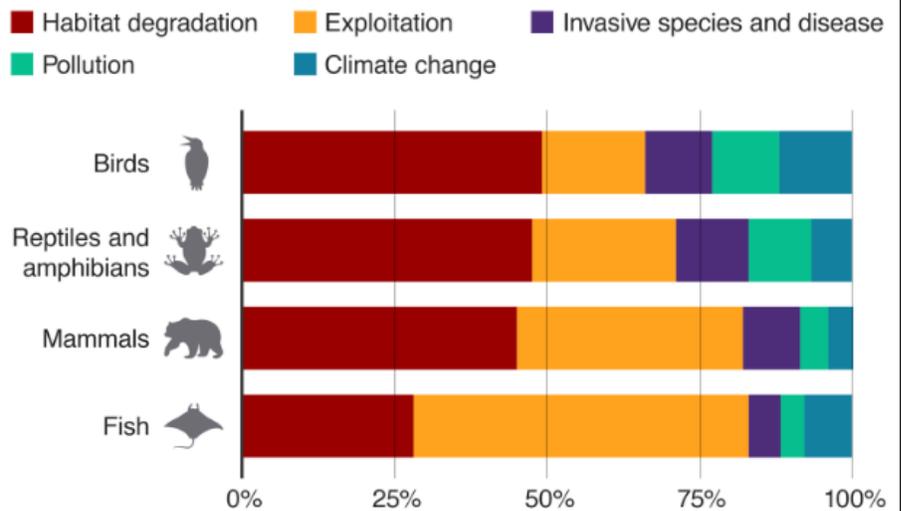
Ecological energy systems give us insights as to why we should restore habitats. A Food Chain is the energy cycle for a specific set of animals and plants. A familiar example is the Monarch butterfly. It depends on specific milkweed plants to lay their eggs and feed their larvae. So, few native milkweed plants are available along their migration on the Pacific Coastline, that their numbers are down to just 29,000 on the west side of the Rocky Mountains.

Food Webs, on the other hand, are more resilient because many plants and animals can feed on the several native plants available for food and for nesting sources. If a food source is missing generalist insects and animals have alternatives. For example, every year the large carpenter bees used nectar from a wisteria vine for nectar. This year, with the early heat, the wisteria bloomed before the females were out foraging. When they returned, they used nectar robbing on salvias instead. This worked because carpenter bees participate in a “food web”.

However, just like Monarch butterflies that participate in a “food chain”, their only source for nesting is milkweed. Many insects, birds and animals have specific food sources. Hence, using an abundance of native plants is part of a wildlife gardening strategy.

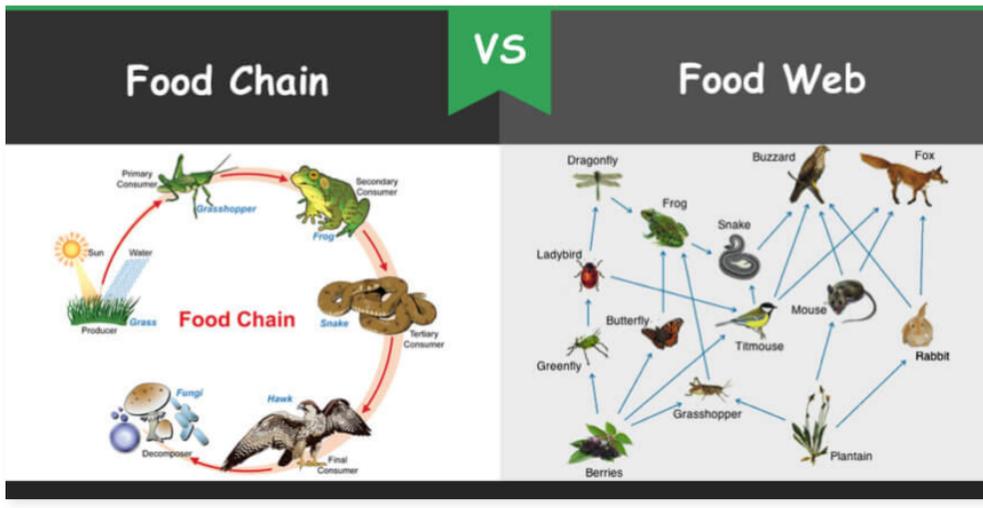
Habitat loss is a major threat to biodiversity

The Living Planet Report assesses key drivers of species decline



Note: A sample of 3,789 populations evaluated by the Living Planet Index

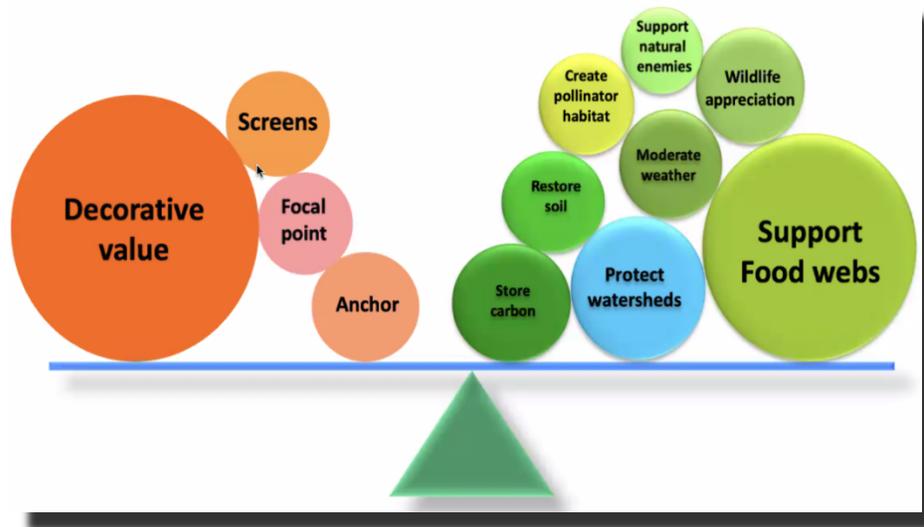
Source: WWF, Living Planet Report 2018



Biodiverse Strategies for Resilient Landscapes

In the past landscaped lawns provided decorative plantings, play areas and heating and cooling weatherization. There are about 40 million acres of lawn in the United States. These 40 million acres uses more water than the 80 million acres of corn produced from farming.

As a strategy to preserve life, it makes sense to habitat by replace as much lawn as we can with resilient wildlife habitats. The right side of this picture shows the goals we can accomplish while increasing biodiversity.



U.C. Davis is working with agriculture to restore habitats on agricultural lands. Urban cities are reclaiming large urban spaces such as airports, abandon railroad land and highways with wildlife landscaping. Already, we encourage lawn conversions for saving water. Now we can encourage those lawn conversions to include wildlife regenerative landscapes, beds and vegetable gardening techniques to restore suburban wildlife habitats. If you have a pollinator garden, you are already participating in wildlife habitat restoration.

Solutions – Climate-Wise Landscape Restoration

Dr. Doug Tallamy, Professor of Entomology and Wildlife Ecology at the University of Delaware has done research for 40 years on insects and birds. To increase survival rates for birds, he recommends “keystone” plants. Birds prefer caterpillars to feed their young which increases their survival rate. A keystone plant is a native plant that hosts the highest amount of insect species. For example, in our area the oak tree *Quercus Fagales* supports 275 species and chokecherry, *Prunus Rosales*, supports 262 species. Working with the National Wildlife Association, he has Native Plant Finder app, which defines the native plants in different zip codes. It is in Beta, so all the native plants are there, but they are still working on showing the species. To fill in that information you can go to [CalScape](#) and search under native plants. This will give you more of the butterflies and insects attracted to specific plants.

Solutions – Further Climate-Wise Landscape Restoration

To join a national movement for wildlife restoration, you can go to [National Wildlife Federation](#) and certify your garden as a wildlife habitat. You may meet all the criteria which is providing food, shelter, cover, places to raise young and some sustainable practices. There is no square footage requirement. It is self-certified online. Then you can buy a Wildlife Habitat sign to put in your garden. Following are guidelines to implement Wildlife Gardening.



Principles of Ecological Design

Along with efforts to support water-wise planting and pollinator gardens, here are some climate-wise planting strategies.

1. Mimic Nature's Design Strategies
 - a. Use Native Plants which evolve along with the indigenous wildlife in your area – start small if you are new to pollinators and planting
 - b. Layer planting – Mother Nature leaves no bare soil
 - i. Place plants of different heights in same area
 - c. Do not till the soil
 - d. Leave some leaves and bark on the ground for nesting and hiding
 - i. Shelter for animals, underbrush, fallen logs etc.
 - e. Plant with bloom successions so there is always food available
 - f. Provide water sources
2. Use keystone plants providing insects as food sources for rearing young
3. Remove invasive plants, replace lawn where you can with native keystone plants
4. Use natural methods to control weeds and insects – no pesticides
5. Plant a wildflower seed mix for beneficial insects around your vegetable beds to provide plant protection, and pollinator food sources.
6. With many people starting gardens for the first time this year, it is a great time to help them practice restoring the landscape while producing their food source options.

I hope this article creates some inspired action toward increasing biodiversity at home. I am writing on how to design and plant a Wildlife Garden specific to Yolo County. Developing this course will take some time, the final part of this series will be published in Spring issue 2021. It is about U.C.D. research on long term climate change effects and solutions as they apply to their Mission of Sustainability

If you find this area interesting, I would love for you to share your ideas, experiences, insights, and questions.

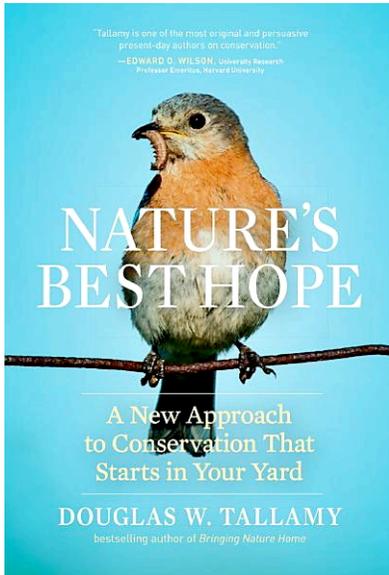
I hope this article inspires some action toward increasing biodiversity. I am in the process of writing a course on how to design wildlife gardens specific to Yolo county. It will be presented through our Master Gardener courses online. If you find this area interesting, I would love for you to come and share your ideas, experiences and insights.

The final part in this series will appear in the Spring, 2021 issue of the *Yolo Gardener*. 🍅

Everything is Connected

Tanya Kucak, UCCE Master Gardener, Yolo County

“Nature has proven to be more resilient, more malleable, and more forgiving than I ever thought,” Douglas W. Tallamy writes in *Nature’s Best Hope: A New Approach to Conservation That Starts in Your Yard*, published in February by Timber Press. That’s good news for anyone who wants to do something productive, proactive, and positive “at the local scale -- the scale that counts ecologically.”



Tallamy offers a well-written, accessible, and well-argued case for using ecological considerations, particularly the food web, as the basis for choosing landscape plants. Amid declines in songbird populations and news of the “insect apocalypse,” it’s heartening to read a scientifically based book about nature’s resilience.

A key concept is learning to appreciate insects, which “sustain the earth’s ecosystems by sustaining the plants and animals that run those ecosystems.” As Tallamy writes, “insects are the animals that are best at transferring energy from plants to other animals...and most insects are very fussy about which plants they eat.”

Another key is including at least some keystone native plants. Tallamy defines “native plants” by their ecological function, that is, the web of “specialized relationships” they have developed with other organisms over evolutionary time. The “keystone” native plants host the greatest number of caterpillars, which are crucial food for most songbirds. (See the note at the bottom of this article on how to identify which “keystone” plant you wish to use in your garden)

Notably, without keystone plants, even a mostly native landscape will not be as ecologically productive, supporting “70 to 75 percent fewer caterpillar species.” One reason is because “interaction diversity” -- the number of plant-insect interactions -- is a better measure of a healthy landscape than species diversity.

Furthermore, nonnative invasive plants degrade food webs not only by replacing a variety of natives with a monoculture, but also by drastically reducing interaction diversity.

Tallamy also recommends paying attention to landscape maintenance. Keeping leaf litter under your trees can enable bees, butterflies, and other insects to complete their life cycles. Other overwintering sites include pithy dried stems, decaying logs, and other nooks and crannies.

Each cluster of habitats created in suburban yards can be “one small piece of a giant puzzle, which, when assembled, has the potential to form a beautiful ecological picture.” These landscapes would depart from traditional landscapes in only three ways:

- * less lawn
- * more total plants
- * a greater percentage of habitat plants -- “the powerhouse species that drive food webs and support pollinators”

If everyone replaced half their lawn area with habitat plants, the resulting “Homegrown National Park” Tallamy proposes would comprise more land area than existing national parks. An added benefit would be the ability to observe “the seasonal progression of species in your yard.” Unlike a rushed annual visit to a national

park, a “lazy afternoon” in your own yard would allow you to have the kind of experiences with nature that take “time, convenience, patience, solitude, and serendipity.”

Some of the best habitat plants are native trees. Addressing concerns about large specimen trees that could threaten structures in small suburban lots, Tallamy notes that in forests, trees “intertwine their roots, forming a root matrix that is nearly impossible to uproot.” If trees are planted in groups of three or more on ten-foot centers, “the resulting root matrix would keep them locked in place through thick and thin.”

Tallamy is a professor in the Department of Entomology and Wildlife Ecology at the University of Delaware, where he has authored ninety-five research papers and has taught insect-related courses for forty years. He also wrote the 2007 book *Bringing Nature Home: How you can sustain wildlife with native plants*. In recent years, his talks to plant-centric audiences have become widely available on youtube. For instance, he spoke about restoring Nature’s Relationships at the 2018 CNPS Conservation Conference:

<https://www.youtube.com/watch?v=3wzcz8dWyBc>

Identifying Keystone Plants

If you are deciding between two natives for your yard, <https://calscape.org/> can give you an idea of how many species of butterflies and moths it may support in California. For instance, Western Redbud (*Cercis occidentalis*) may support 11 species, but Blue Elderberry (*Sambucus nigra* ssp. *caerulea*) may support 23 species and also provides berries for birds.

To see a list of keystone plants -- locally native plants that support the most species of butterflies and moths -- in your area, start at <https://calscape.org/>. From the top menu at Calscape, click on Butterflies, then enter your zip code. On the next page, choose Host Plants. Under Options, choose Order by # of Butterflies Hosted, Hide Plants Not in Nurseries, and Grid View. The resulting page shows you thumbnails of likely and confirmed host plants for butterflies and moths, with number of species hosted under the thumbnail. For 95616, I found a list of 159 plants. 🍅

Summer Gardening Tips

Peg Smith, UCCE Master Gardener, Yolo County

Well! What a long strange trip it has been since last summer! It has been reported by many news outlets and I have heard from friends and family how working in our gardens has helped many of us manage through these times. The act of gardening is one of hope, caring and looking to the future - for flowers, fruit, vegetables or by just pausing to appreciate the simple beauty of plants we have grown, sun-tipped foliage or grass moving gently in the wind. May these garden blessings give you strength, hope and an eye to the future.



One of the best gifts I received for my garden were two small signs: one ‘I tried but it died’; the other ‘Housework whenever: Gardening forever’. (I may have taken the second sign a little beyond what was intended.) There are many folks taking up gardening for the first time and perhaps just joining our Yolo Gardener readership. Our ‘Gardening Reminder’ section covers, for each season, the most common tasks to help keep a garden healthy and growing well but do remember ‘I tried but it died’ can happen to even the most experienced gardener. Welcome to all our new gardeners!

Most plants should be in by now before the summer heat but remember the root ball that provides nutrition and water to any new planting is at first only the size of the container from which it came. The first two to three years for new plants establish the future health of your plants. The soil area around new plantings needs to be kept moist, but not soggy, so that roots can penetrate out into the surrounding soil to provide strength and nourishment. New plantings should be checked daily and watered on an ‘as needed basis’. Adjust your watering or irrigation system to water more frequently until plants are established. As the plants mature the frequency and length of the watering cycles can be extended to give less frequent but deeper watering for good root development.

Watering is best done in the morning hours, a deep soaking on a regular schedule early in the morning will carry most plants through the heat of the day. Some plants will appear wilted with the onset of intense afternoon heat. Particularly plants in the squash family (cucurbits, squash, cucumber, melons). Before adding more water to ‘give them a lift’ check the soil to see if it is nicely damp. If the soil is damp the plant is most likely unable to pull up enough moisture from the soil to counterbalance the amount of water the plant is losing through its leaves by evapotranspiration because of the heat. Allow the plant to recover overnight and check wilt and soil dampness again in the morning. Eager gardeners can tend to overwater drooping plants. Plants don’t do well with too much or too little of a good thing - water. They will wilt because of too much water as well as wilting because of too little water. To be healthy a plant requires around its roots an approximate combination of 25% air, 25% water and 50% soil. If we over or under water the plant will wilt and be stressed.

Slugs and snails have done their damage and are again hidden by the time most of us are out and about in the morning. Keep up the control of these voracious feeders by replenishing beer traps frequently. Slugs and snails are not connoisseurs and will succumb to the cheapest non-alcoholic beer. To make a beer trap, half fill a shallow container - cat food tin, pint yoghurt container – sink it in to the ground then clean up your catch in the morning. Also, for the control of slugs or snails various brands of commercial pelleted products containing Iron Phosphate are available from most garden nurseries or stores and can be scattered on the soil or mulch surface. Avoid products containing metaldehyde as they can harm dogs and other animals.

Take care of your own gardening health by working in the early hours of the day or in the shade, drink plenty of water and take rests to survey your good gardening work. Summer is a good time to think of what you would like to tackle in the Fall. Gardens grow and change with time they are certainly not a one and done project. Taking the time to develop a plan to improve a garden in small bites rather than massive projects makes garden ambitions ‘doable’. Look at other gardens (Central Park Gardens, UCD Arboretum), and see if there are additional plants that will appeal and complement what you have created. Several gardens such as the Ruth Bancroft Garden <https://www.ruthbancroftgarden.org> are holding webinars on a variety of topics.

- **Water**

Become familiar with your city water restrictions and do your part to save water. Remember to place plants with similar water requirements together in your garden to maximize water efficiency.

Conserve water. Keep your plants happy and help to keep the weeds at a minimum by adding mulch to your garden. Four inches of mulch will inhibit weeds, conserve water and keep a plant’s roots cooler. Also, if you are not using drip irrigation consider this for some areas of your garden. Gardening with limited water tips- <http://ucanr.edu/sites/YCMG/files/184804.pdf>



Several native bees are ground dwellers so always set aside an area of un-mulched dirt to encourage them to stay and reproduce in your garden. Bees need water, a shallow water filled tray with a few rocks for the bees to rest on will attract many of our native bees and the basic honeybee to your garden.

- **Pests and Diseases**

Prevention is the easiest way to minimize plant damage. Stroll through your garden several times a week to scout out potential problems. Regularly check the leaves and flowers for evidence of pests and diseases. Typically, the hot summer heat increases pest activity. If you have a pest or disease problem that you are unable to identify take as good a quality photo as you possibly can and email it to the UCCE Master Gardeners of Yolo County. The office is currently closed but Master Gardeners are responding to any questions received from the phone line or emailed to mgyolo@ucdavis.edu. Another invaluable resource you can consult to help identify the pest or disease in a plant is www.ipm.ucdavis.edu for an extensive list of articles and photos for the correct treatment.

Whitefly, spider mites and katydids enjoy feasting on many kinds of plants. Thrips and horntail wasps disfigure roses, and leaf miners and hornworms chew tomatoes. Blasts of water and handpicking (hornworms) early in the morning will deter most infestations.

If the cooler spring weather has caused an increase in powdery mildew and rust fungus on susceptible plants, it is usually not necessary to treat with fungicides. The warmer summer temperatures will help reduce this problem. If the problem does remain the UCD Integrated Pest Management website will provide step by step help to a least toxic solution to the problem. www.ipm.ucdavis.edu

- **Weeds**

Get them small and get them often! Weeds are opportunistic and will grow wherever there is space or moisture. A cottage garden approach with taller plants at the back of a bed and then various height plants down to ground cover will mature into a garden that has little space for weeds to take over. To prevent weeds establishing, mulch around plants to smother out new weed growth. Larger weeds are more easily and completely dug out when the soil is moist.

- **Lawns**

Follow your city watering guidelines for what days watering is permitted. Grass can survive with less water than you think. Set the mower blade at a higher setting and recycle the clippings by using a mulching mower or mixing them into the compost. Grass clippings add nitrogen when decomposed. Deep watering lawns on a regular, but less frequent timing, will encourage deeper root growth that will help grass survive the summer's heat. Considering removing the lawn? Check out this site for the technique that works best for you. www.ucanr.edu/scmg/Lawn_Replacement/Grass_Removal_Methods

- **Fruit**

If you (or the squirrels) haven't thinned your fruit trees and vines, they can still benefit. Thin fruit trees (apple, peach, cherry, apricot and grapes), so that there is 6 inches between each fruit or cluster. This may seem drastic, but your fruit will be larger, more flavorful and it will greatly reduce the risk of broken limbs and branches because of the weight of the fruit. Mature fruit trees need a deep soaking every week during crop production. Grapes do best with deep water to a depth of around 18 inches and then allow them to dry to a depth of about 6 inches between watering. Birds can be deterred by using netting and by placing shiny objects in the canopy. There are commercial, bright reflective tapes available. Old CDs work as well when strung from tree branches.



How you care for your fruit trees during the summer months will help determine the fruit production of the next season. Deep soak fruit trees throughout the summer. Drip irrigation or soaker hoses installed towards

the edge of the leaf canopy are the most efficient ways of deep watering for fruit (or any other) tree. Fertilize (follow the label directions) or top dress around the fruit tree with a layer of compost or humus. Summer pruning of fruit trees is for shaping to give strength to branches for the next year.

The Cherry Maggot (*Drosophila suzukii*) has invaded home cherry crops for the past several summers. The maggots are not discovered until the cherries are ready to harvest. There are several methods of reducing or eliminating this pest. The most environmentally-friendly method is to use Spinosad with 4-6 tablespoons of molasses per gallon of water. For a complete discussion of this pest problem visit www.ipm.ucanr.edu/PDF/PEST/NOTES/pnspottedwingdrosophila.pdf

- **Vegetables and Herbs**

The most popular vegetable (technically a fruit) is the tomato. It usually grows effortlessly and is happiest when it is deep watered 2 times a week. This helps reduce cracking, ridging and blossom end rot. Tomatoes will shut down blossom production when it is in the 100s. Keep an eye out for small black droppings (frass) of the tomato hornworm. Look around and above where you see the frass and hand pick any tomato hornworms you find. The hornworms will damage both the leaves and the fruit.



To keep vegetable crops continually blooming, harvest regularly, and continue inspecting for pests. In August, pinch

back the plants to help the existing fruit to ripen before the cooler weather arrives. Harvest herbs just as the flowers begin to form for the most intense flavor. If your harvest is bountiful, dry your herbs, by hanging them upside down in bunches for future use.

Surprisingly now is the time to begin thinking about your fall/early winter vegetable harvest. Fall/early winter vegetables, such as broccoli, cabbage, and Brussel sprouts need to be seeded in late July then transplanted in August/September for your fall/early winter vegetable garden. Shelter these from the intense summer sun and any particularly hot Fall days. Shade cloth draped over a simple support frame will keep these plants strong and healthy to produce in the early winter.

- **Flowers**

Flowers need to be deadheaded to encourage repeat blooming. Continue to fertilize your flowers, especially heavy feeding roses, every six weeks through October. For a full October bloom, prune your roses back by 1/3 in August. If you prefer the beauty of rose hips, then refrain from pruning your roses in August.

Potted plants and hanging baskets will develop well if given a weekly feeding of liquid fertilizer. They also require more frequent watering.

Tall herbaceous plants such as cosmos, dahlias need to be staked or supported.

Prune spring blooming shrubs after the blossoms drop. Spring blooming vines such as lavender trumpet vine and clematis should be pruned after the blooms have faded, fertilize after pruning to encourage bud set for next spring

It is not too late to plant quick blooming summer seeds, such as nasturtiums, sunflowers and cosmos. You can also plant summer blooming bulbs, such as dahlias and cannas.

Continue to harvest your vegetable and herb crops on a regular basis, to promote and prolong summer's bounty.

Summer gardens bring enjoyable surprises and anticipation. Try planting some new flowers, herbs and vegetable varieties. You may discover that you have a new favorite to add to your tried and true plantings.

Tend to your summer garden regularly and it will provide a season of bountiful rewards and be a welcoming summer retreat.

Garden Tours from Your Armchair

In the time of Covid-19 we are limited in our travel and ability to wander through public gardens seeking inspiration and knowledge. Many public gardens have set up 'Virtual Tours' so we can at least vicariously feast on the beauty of other gardens locally, across the country and also overseas. Although the many interwoven scents of any garden are not there here's a few 'Garden Tours' I hope you will enjoy!

US Botanic Garden

<https://www.usbg.gov/take-virtual-tour>

Chicago Botanical Garden

https://www.youtube.com/watch?v=aV0Ryaw0hGc&feature=emb_logo

Hidcote Virtual Tour:

https://www.nationaltrust.org.uk/hidcote/features/hidcote-virtual-tours?awc=3795_1592253826_7810ce3a4e05d5c55d18c30e67138eea&campid=Affiliates_Central_Mem_AWI_N_Standard&aff=78888

Highgrove Gardens Tour:

https://www.youtube.com/watch?v=OAbeYk_vSaI

Kew Gardens Tours:

<https://www.kew.org/about-us/virtual-kew-wakehurst>

Birmingham Botanical Gardens

<https://www.birminghambotanicalgardens.org.uk/venue/virtual-tour/>

Monet Gardens:

<https://www.youtube.com/watch?v=rjWx2WNXFF4>

Scotland's Gardens

<https://scotlandsgardens.org>

Keukenhof Gardens

https://www.youtube.com/watch?v=SNgi9agkbB0&feature=emb_title

HOW TO CONTACT US:

Like us on Facebook: UCCE Yolo County Master Gardeners.

Check our website for upcoming workshops and FREE gardening publications:

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

Email questions: mgyolo@ucdavis.edu

Telephone: 530-666-8737.



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
 70 Cottonwood Street
 Woodland, CA 95695

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 UCCE Yolo County
 70 Cottonwood St.
 Woodland, CA 95695

STAFF

Jim Fowler, Managing Editor
 Jennifer Baumbach, Editor
 Jim Fowler, Layout



WRITERS

Cid Barcellos, Jim Fowler, Jack Kenealy, Michael Kluk,
 Tanya Kucak, Michelle Haunold Lorenz, Peg Smith, and
 Deborah Sorrill

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This newsletter is a quarterly publication of the University of California Master Gardener Program of Yolo County and is freely distributed to County residents. It is available through the internet for free download:

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

A handwritten signature in black ink that reads "Baumbach".

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